OCT 17 1933

VETERINARY MEDICINE

November, 1933

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No. 11
VOL. XXVIII

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VOL. XXVIII NOVEMBER, 1933 No. 11

Published Monthly by the Veterinary Magazine Corporation
75 East Wacker Drive, Chicago, Ill., U. S. A.
$4.00 a Year

Entered as second-class matter Nov. 8, 1920, at the post office at Chicago, Ill., under the Act of Mar. 3, 1879.

Entered as second-class matter under the title of American Journal of Veterinary Medicine, July 19, 1910 at Chicago, Illinois, under Act of March 3, 1879.

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, 230 Fifth Ave., New York, Eastern Representative

Chicks are most susceptible to parasitic infestation particularly the round worms the first three months after hatching. Improper feeding and unthriftiness are an important predisposing factor to parasitism in chickens.

* * * *

The days when cures might be expected to be discovered by accident have surely gone, with the belief in the efficacy of incantation. Knowledge alone can save us, and that can be attained only by patient searching and experiment.—*J. A. Gilruth.*

* * * *

The veterinarian's business is to apply his general knowledge to a special case. He can't do it by proxy. The real art of medicine is diagnosis. Laboratory diagnosis of parasites is one of the soundest of laboratory processes, but there are contra-indications to the use of every anthelmintic. What about that? Suppose a sample of feces is sent in to the laboratory and an accurate diagnosis made. The laboratory technician is not justified in prescribing a treatment or supplying a remedy because he has no information about the special conditions, the contra-indications. I would not trust my client to give any anthelmintic. There are too many holes in anthelmintic treatment.—Maurice C. Hall.

M. Klimmer in a review of the literature found that in the record of 1,333 eggs from tuberculous hens, 5.7% contained tubercle bacilli.

* * * *

It is advisable to prepare fowls for major surgical operations such as caponizing, by fasting for twelve hours. Feathers should be removed before the operation and the skin surface cleaned and disinfected. Anesthesia may be resorted to, particularly in operations on the head, but the sensorium of the fowl is not well developed and local anesthetics usually suffice.

* * * *

A recent Bureau study of biologics produced under United States licenses and permits shows a general upward trend in the kinds used to prevent disease, or to diagnose it before outward symptoms are apparent. The quality of anti-hog cholera serum produced and distributed is now about five times as great as in 1915 and 1916, shortly after commercial production began. In the last dozen years, the output of canine distemper serum has increased about tenfold; of rabies vaccine more than a hundredfold, and that of some poultry biologics even more. The production of tuberculin has increased greatly in the last 15 years. New biologics are constantly being developed and produced.—John R. Mohler.

Recent studies at the Nebraska Experiment Station indicate that the vitamin A and E content of artificially cured hay is about twice that of field-cured hay.

* * * *

It has been found that timothy hay does not supply the necessary mineral ingredients for dairy cows. Legumes such as clover and alfalfa usually supply the required minerals. However, the assimilation of minerals, regardless of their source, is apparently dependent upon exposure to sunshine.

* * * *

Property values vary with the price of products produced by the plant. This is particularly true of the farm plant—$2.00 milk means $100.00 cows; 75c milk means $35.00 cows; $1.00 corn means $10.00 hogs; 30c corn means only $3.00 hogs.—*Wis. Exp. Sta. Bul.*

* * * *

During the years preceding the depression, Illinois farmers turned from horse power to mechanical power to the extent that a total of 70,000 tractors were being used in this state in 1929, while the number of horses had declined from 1,452,887 in 1910 to 820,850 in 1930.

* * * *

In addition to the chemical composition, something should be known about the quality of the products that go to make up a feed. Since vitamins are very essential for all live stock and since they are factors which demand quality, they must be considered just as essential as proteins, or calcium, or carbohydrates.—*Ohio Ex. Sta. Bul.*

* * * *

Sleep, according to recent investigation, is a form of intoxication due to accumulation of toxic substances in the blood. It has been also demonstrated that the blood is detoxicated by sleeping, the length of time necessary for an individual to sleep depends upon the degree of intoxication and the capacity of the organs of elimination. Some scientists will no doubt attempt to devise some means of preparing an efficient antitoxin and thus eliminate the necessity of sleeping.

Prickly pear was introduced to Australia from America and soon took possession of sixty million acres of grazing lands. An insect enemy has recently been introduced that appears capable of holding in check the spread of the American cactus.

* * * *

The gypsy moth, now a serious menace to American forestry was introduced from France in 1869 on the fanciful notion that these moths could be crossed with silkworm moths to produce a hardy race of silk producing insects.

* * * *

According to Morrison of the Ohio Agricultural Experiment Station, the hourly cost, including labor, interest on investment, taxes, depreciation, fuel, etc., for operating a two-plow tractor on Ohio farms is 93 cents.

* * * *

An attempt is being made at the South Dakota Experiment Station to develop a tailless breed of sheep. Of 53 lambs born in this experiment last spring, only four had tails more than three inches long and none over five inches long. Fifteen had no tails at all and 25 had tails less than two inches long.

* * * *

R. L. Zwemer of the College of Physicians and Surgeons, Columbia University, reports that the vital cortex of the adrenal glands may have an influence on the relations of salt and water in the body similar to that of insulin on sugar, the parathyroid glands on calcium and the thyroid glands on iodine—*S. N. L.*, 23:636.

* * * *

A conservative estimate indicates that 85,000,000 pounds of nitrogen are fixed annually out of the air by the bacteria on alfalfa and sweet clover in Illinois, and nitrogen is one of the readily depleted fertilizer elements and the most expensive one that Illinois farmers have to buy. If they had to pay market prices for this nitrogen, it would cost $8,500,000 annually, even at present low prices.—*Ill. Exp. Station Rept.*

In the epidemic of 1770-71, three million people died of small pox in the East Indies. —*S. N. L.*, 24:646.

* * * *

The disease beri-beri, due to deficiency in the diet, is the cause of 17,000 deaths in Japan each year.

* * * *

Exposure to light is bad for all liquids from beer to kraut juice. Green light has been found to be the least harmful and therefore green tinted bottles are best for the preservation of liquids.

* * * *

Tapeworms of man from the Baltic Sea countries have spread in the Great Lakes region, particularly in Ontario, where they infest fish as the intermediate host, and endanger human beings who eat the fish raw or inadequately cooked. The natural reservoir of infection is dogs that eat raw fish.

* * * *

A case of urinary amebiasis in the human was reported by Worsley and Bateman in the *Journal of Tropical Medicine and Hygiene*. The parasites were apparently the *E. hystolitica* in the precystic stage. This was an unusual case of amebiasis. The source and manner of infection has not been determined.

* * * *

Within the last decade, 8,894 dogs' heads have been examined for rabies in the State Public Health Laboratories of Illinois—an average of nearly three per day. Of these, 3,272 were found to be infected. Material for the Pasteur treatment of 726 people was provided free by the Illinois Health Department during the first eight months of 1933.

* * * *

Prior to the World War, typhoid fever was the greatest scourge of mobilized armies. During the Civil War, twice as many men died from typhoid fever alone as died from all causes in our army in the late war. Had the typhoid fever death rate of the Spanish American War prevailed during the World War, 60,000 more lives would have been lost in our field forces.

It has been estimated that there is at least one narcotic drug addict to each 1,000 of the general population of the United States.—*Public Health Reports.*

* * * *

Manville of the University of Oregon Medical School, reports that white rats fed a diet deficient in vitamin A developed stomach ulcers and erosions. Nearly 100% of the rats used in the experiment were found to have stomach ulcers.

* * * *

A disaster every five and one-half days. This was the average for nine months of the disasters of nature in which the American Red Cross rendered aid. Beginning with the Long Beach earthquake in Southern California, March 10, and ending the middle of May, disaster struck in 139 counties in 21 states. Five of these states were stricken three or more times within that period. The American Red Cross is America's assurance that suffering and want shall not follow upon disaster and great emergency. It is the pledge of the Greatest Mother that human needs shall be met even before the hurricane subsides, or the flood crest shall be reached. * * * *

No commercial firm in the cotton line has ever handled the volume of business, acording to trade reports, that has been transacted by the American Red Cross in yardage and ready-made garments during the past year. Delegated by Congress to the task of converting first into textiles, then into clothing 844,000 bales of raw cotton, for the relief of the unemployed, the Red Cross, through its nation-wide network of chapters and branches, distributed more than 104,000,000 finished garments. These consisted of every type of clothing from underwear, socks and babies' layettes, to overalls, jumpers and sweaters. If spread out in yard strips, the textile material would have girdled the earth one and one-half times. In its manufacture 374 mills were employed, thereby further extending the relief, inasmuch as but for the Red Cross consignments, many of these mills would have remained idle.

The Veterinarian and the Health Officer*

By EMMETT R. GAUHN,
Chief, Monroe County Department of Sanitation, Rochester, N. Y.

FOR a long time the relation of the veterinarian to the health officer, or to the health department, was not well defined nor well understood, and in the minds of many people, including health officials, the rôle that the veterinarian was to assume in the protection of public health was not clear. The veterinarian was largely concerned with the treatment or cure of disease in animals. While he gave advice and counsel to his client, which is the thing he should do to protect animals from further invasion by disease organisms, his work was very largely limited to a comparatively small circle of clients. Also, as a rule, it was not too well coordinated with any program for the eventual control or eradication of any one disease. He, himself, because of the nature of his work, was largely an individualist, meeting his own problems to the best of his ability in the light of the information available.

A few of the larger cities employed veterinarians to care for specialized work within the scope of their profession and of course the Federal Government, through its Bureau of Animal Industry, furnished an invaluable veterinary inspection service at meat packing centers and places where animal products used for human food were prepared and processed.

IN THIS state, beginning about the time when the State Department of Health was reorganized in 1913 and through the keeping of statistics from which many facts were learned, it became apparent that if we were to deal effectively with the problems arising from the transmission of disease of animal origin to humans, we must have the knowledge and the judgment of the veterinary profession. So, we began in a meager way to demand physical examination by competent veterinarians of all cattle whose milk was usually consumed in its raw state, prior to the sale of such milk. We also demanded that the veterinarians performing these physical examinations should be approved by some authority in the State in order that we might be sure that a certificate filed meant exactly what it said and that the examination was performed by men who were properly trained in their profession. These physical examinations, even though they were incomplete and sometimes hurriedly performed, did a great deal of good in pointing out to dairymen, veterinarians and health officers the need of further work of this character.

In comparatively recent days many veterinarians misunderstood the reason behind the demands that were being made upon them, but as the profession and public generally began to visualize the magnitude of the task of preventing any transmission of harmful character from animal to man through the medium of milk or meat, or the by-products of either, the knowledge of the veterinary profession on these subjects increased until today it would be almost unthinkable for any health movement to operate without the advice and assistance of the members of this profession.

THE question of the Public Health importance of cattle diseases and their relation to humans is one of many angles. Sometimes the line between health and economics is not clearly defined. Sometimes things that of themselves have no Public Health significance do cause so much loss and trouble that because of this loss and trouble other things that have a real Public

* Broadcast over Station WGY, August 11, 1933, auspices New York Veterinary Medical Association.

Health value are neglected. It is, perhaps, needless to say that the congregation of many people in cities and the consequent bringing in of milk and food supplies from greater distances make necessary a great many changes in the handling of these food supplies. These changes are always advised with one thought in mind, "safety" and "palatability" of the product when it reaches the consumer.

We have seen one disease, Tuberculosis, always a menace to humans, start in a small way in cattle and increase until it threatened the economic stability of all of our dairy industry. This disease finally lent itself to almost complete eradication in some parts of our State and to a definite decrease in infection in all of the State. This was not possible because of any effort on the part of educators, scientists, or governmental officials alone, but very largely because the practicing veterinarian carried the truthful appraisal of the entire project to his client and convinced that client that he should subscribe to this eradication movement. Without that type of cooperation the success attained in New York State would never have been possible and to the practicing veterinarian, apart from his professional brother who is engaged in public health work, should go a very large measure of the credit for the reduction of the amount of infection from this particular disease in this State.

To review the details of all of the work that has been done in this peculiar campaign would take considerably more time than is allowed to us today. Suffice to say that the State of New York and Federal Government have spent many millions of dollars and are contemplating expenditures of many millions more in order that eventual eradication of tuberculosis of cattle may take place.

WE HAVE seen the rise of another menace in cattle, mastitis, potentially harmful, perhaps, insofar as it affects public health, but a very real insofar menace to the economic status of the herd owner. That the importance of mastitis was recognized by public health officials has been due largely to the research work of veterinarians in public health employ coordinated with veterinarians in commercial fields and with the laboratories. The eventual methods for the control of this problem will be evolved by these men working in cooperation with the laboratory and with the practicing veterinarian. Looking backward, it seems but a very short time since an almost complete change has taken place in the minds of men regarding the duties of a veterinarian in helping to protect public health.

Those of us who live in the cities and who take our bottle of milk from the doorstep in the morning, without much thought of the care and the effort that has gone into its production and processing, may be truly thankful for the strides made by the veterinary profession in helping to protect us from many harmful effects which may occur so easily when intelligence and care are not exercised and when knowledge is not used in the preparation of our food products. When we, as a community, realize that we are dependent on a multiplicity of factors for our own safekeeping and for the welfare and health of our children, we will appreciate more fully the task which must be assigned to the veterinarian in the protection of public health. Public health is your health and my health and it is only a question of multiplication. It is easy to say that things which would affect only a few people, at the most, should be ignored, but if you or I happened to be one of those few people insofar as our personal fortunes are concerned, our attitude would be just the same as if the condition affected many people.

IT HAS been our privilege to see College Heads debating on the advisability of adding training in public health as a part of the regular course in veterinary medicine. This argues that we are beginning to realize that all of us must add each bit of the knowledge which we possess to the field of prevention work, or else not all will be accomplished that should be accomplished. But, with the proper coordination and co-

operation of the veterinary profession, the medical profession and sanitarians, and with the proper recognition by each of the others in their specialized field, even greater results, than have been attained in the past twenty years, will be possible in the next twenty years. Those who come after us will then be able to say that at least we have fulfilled to the best of our ability the responsibilities which have been entrusted to us and that we have attempted to do the job as we saw it, as best we might, to make this world a better and easier place in which to live and enjoy, and that as much as to anyone else, credit for this type of work must be given to the veterinary profession.

Certainly, no health officer with knowledge of his duties or with any understanding of the problems which do and which will confront him continually, would wish at the present time to attempt to carry out his program without the aid and assistance of men trained in this profession.

Sources of Bacteria in Milk

The cow and the milk utensils are the two main sources of bacteria in market milk. With the cow, common cleanliness is all that is needed. Everyone will agree that the milking should be done in such a way that almost no dirt passes from the animal to the milk. Clean cows are essential to good milk.

The milk utensil, however, may look perfectly clean and yet be very dirty. If a milk utensil is smooth, bright and shows no leftovers of milk, one is quite certain that is is clean, and yet it may be far from that. It may contain so many bacteria as to injure the keeping quality of the milk placed in it, much more than another utensil which looks the same.

In other words, dirt in our milk utensils is more than dirt. It also includes the idea of bacteria, living organisms which are waiting for a chance to grow, an opportunity which the utensil often gives. From the standpoint of quality of milk, one may say that a utensil is cleanest when it has no living bacteria in it. Its walls may be rough; they may be coated with milk stone; it may show accumulations of milk, and yet it may not at all injure the milk placed in it because it may contain few or no living bacteria.

If the dairyman is to avoid the injurious effect which utensils have on milk quality —and nothing else is probably so important —he and all those who are interested in milk improvement must think in terms of bacteria and not simply of visible dirt.—*Cir. 259, Col. of Agr., Univ. of Wisc.*

Raw Milk and Undulant Fever

Domestic stock, usually cattle or swine, is the chief source of undulant fever in humans. The disease reaches man through one of three channels. These are (1) raw milk, from infected cows; (2) direct contact with infected domestic stock, and (3) the handling of meat.

Starr and Maxcy found that in Virginia about 60% of the known cases of undulant fever were attributable to the consumption of raw milk from infected herds and that about 40% appear to have resulted from direct contact with infected animals.

"It is to be noted," say these investigators with reference to undulant fever in Virginia, "that up to the present not a single case of undoubted undulant fever has been found in an individual who customarily consumed pasteurized milk."

"In every instance" they add in commenting upon twenty-six cases which gave no history of contact with cattle, swine or goats, "the patient was a customary consumer of raw milk. In nine instances, it was possible to test the herds which were named by the patients as their usual (though not always only) source of milk. The serological results indicated that eight out of the nine herds were undoubtedly infected with Bang's disease. One herd which could not be tested gave a clear history of contagious abortion, and in one instance the clinical history and the serological test of an implicated herd was negative."

The summary of the report of the studies made by Starr and Maxcy, as it appeared in the July, 1933, issue of the *Virginia Medical Monthly*, reads as follows:

"In brief, this investigation has established up to the present that contagious abortion is widely distributed in the dairy cattle of Virginia, as a general average about 10% being affected. Its intensity and prevalence, of course, varies in different parts of the state, the dairy farming sections, as would be expected, showing the highest incidence. Although swine are occasionally infected, the disease does not appear to be the serious problem in these animals that it is in cattle.

"Cases of undulant fever in man are occurring occasionally in the state, particularly in those areas which show a high infection rate among cattle and a high per capita consumption of raw milk. About 40% of the human cases appear to be attributable to infection by direct contact, and about 60% to the consumption of raw milk from infected dairy cattle. As yet no case has been discovered which can be attributed to contact with infected swine or goats."

Undulant fever has not yet become a widely prevalent disease among humans. On the other hand it appears to be on the increase. For those who get the disease the experience is exceedingly expensive. It usually incapacitates a person for several months at best.

Undulant fever was first recognized in Illinois in 1928 when one case was reported. During the next year thirty-seven cases were reported and then 63, 124 and 76 in the three succeeding years. The first half of 1933 brought a total of 42 reported cases in this state.

Undulant fever is not always or perhaps is seldom easily recognized. It may be mistaken for typhoid fever, malaria, tuberculosis and perhaps rheumatic fever and influenza. Ey and Van Orsdall of the Ohio State Department of Public Health describe a typical case of undulant fever as follows:

"The temperature rises, step-like, just a little higher on each successive night—falling in the morning—until it reaches about 103 to 105 degrees Fahrenheit. Profuse night sweats are characteristic. These generally occur between 2 and 4 a. m. There is little change for one to eight weeks, then the temperature gradually declines, and by another fortnight may have reached normal, or even subnormal; in a minority of cases the temperature will rise again after a remission lasting several days. In the interval between attacks of fever, the patient may feel a little weakened, but otherwise normal. As these recurrences continue—they may last for a year or more—there is a marked anemia, functional cardiac murmurs develop, and various skin lesions may appear. There is loss of weight, prostration may be extreme, and the patient becomes greatly depressed."—*Illinois Health Messenger.*

Green and Shillinger report the isolation of *Pasteurella tularensis* from a grouse.

* * * *

Green and Wade report the finding of *B. tularense* in a quail, also experimental infestation of a muskrat, Hungarian partridge and ringnecked pheasant with *B. tularense.*

* * * *

Are Mineralization and Vitaminization of Milk Advisable?

The general mineralization and vitaminization of foods, including milk, would further complicate an already complicated situation. Vitaminization and mineralization of foods probably cannot be justified except where natural foods fail to furnish these vital factors. This is especially true of milk. To add various vitamins and minerals to milk haphazardly would, in our opinion, jeopardize the unique and excellent position which this product now enjoys in the eyes of the general public and the medical profession. In spite of the intriguing mystery and glamor that surround some of the newer discoveries in nutrition, we must not lose sight of the fact that plain, ordinary milk is the best single food we have and is thus considered by all. The fact that a sufficient intake of calcium cannot be obtained except by the inclusion in the diet of some form of milk or cheese places these dairy products on a pedestal by themselves. However, the incidence of rickets is still greater than it need be. In the past we have depended upon such antirachitic agents as cod-liver oil, viosterol, and sunshine, natural and artificial. It is not because of the ineffectiveness of these sources of vitamin D that rickets is still with us. Rather, it is because of insufficient or unfaithful use of these materials, for which condition parents are probably chiefly responsible. Whatever the explanation may be, the fact remains that the incidence of rickets is still too great and will continue to be until some cheap, generally available, agreeable source of vitamin D is provided. Vitamin-D milk seems to offer promising possibilities of meeting these requirements.—*W. E. Kraus, Ohio Exp. Sta.*

Equine Diseases and Accidents of the Field and Turf*

By A. A. COMERFORD, M.R.C.V.S.,
Potton, England

Disease and accident in hunters and blood stock can occasion very serious loss, not only in a pecuniary sense but also on the score of disappointment, as, for instance, the loss of a favorite hunter during the season. It is not so much the actual illness or accident, though that may be serious enough, as the resultant loss of condition, which may take weeks to regain after recovery from the disability.

Strongylosis

Perhaps the most serious condition affecting horses today, both in racing and hunting establishments, is the prevalence of strongylosis. This disease is of the utmost importance and is responsible for heavy losses to all classes of horse owners, but especially to the hunting man. It is principally confined to young animals grazing on old horse pastures and therefore is very frequently met with both in racing and hunting stables.

The symptoms are those of general unthriftiness, with staring coat and loss of condition. Diarrhea is sometimes present, the animal appears dejected, there is grave debility and death frequently supervenes. These symptoms may be so very gradual in their onset as to escape notice until the disease has reached an advanced stage. In a large number of cases the trouble is never suspected until conditioning is started and the horse fails to respond, or perhaps the trouble does not assert itself until the season is well on its way and a sudden loss of condition occurs, for an affected animal is incapable of sustained hard work.

Other symptoms noticed are periodic diarrhea; perhaps the bowels are loose for a few days and then become normal, the diarrhea recurring at intervals of a fortnight or so, then becoming more frequent and ultimately continuous. The subject becomes anemic and emaciated and dies from debility resulting from chronic diarrhea. This condition is more probably due to the larval stage and not the mature worm. Fecal examination under the microscope will show a very heavy content of eggs.

Attacks of colic may be frequent, due to the mucous membrane of the colon being extensively damaged or through the presence of worms in the mesenteric arteries. Intermittent and recurring lameness in one or both hind legs may be observed, which finally becomes persistent, due to aneurysm in the anterior mesenteric artery or its branches.

Strongylosis is so prevalent today that it would appear almost necessary for a fecal examination to be made before a certificate of soundness is complete. To produce disease it is necessary for the parasites to be present in large numbers. They do not multiply in the body of the horse, but are picked up individually from the herbage. The presence of many worms in the horse is therefore the result of heavily-infected pastures, itself the result of overcrowding. Infection can be carried in hay, but it is doubtful if a water supply can be responsible as the larvæ cannot swim and their oxygen requirements are such that they cannot live in water over six inches deep. Stable manure is naturally infective but, if heaped and allowed to heat, decomposition will kill the larvæ, except those in the outer six to eight inches of the heap.

Treatment is of value only for the expulsion of mature worms found in the intestines. The immature forms found in various organs and those encysted in the mucous membrane of the intestines are not affected by any drug.

*Presented at the 51st Annual Congress the National Veterinary Medical Association of Great Britain and Ireland, Llandudno, Sept. 18-23, 1933.

Dilation of the Heart

A not-infrequent condition affecting the racehorse and hunter is dilatation of the heart, either as a result of cardiac weakness or due to valvular incompetence. Heart weakness or cardiac insufficiency is a decreased capacity of the heart muscle to deal with extra strain. It occurs as a result of muscular over-exertion, under which condition there is an excess venous inflow to the heart accompanied by a corresponding increase in arterial resistance. Such a condition may occur when a horse's work has been restricted as, for example, during a period of frost, and on work being resumed he experiences a long and tiring day. A similar condition may result following an infectious disease, *e.g.*, influenza, or strangles.

Symptoms of heart fatigue usually occur suddenly after or during over-exertion. There and dyspnea and cyanosis, extreme weakness of the pulse with increase in its rate, and profuse perspiration. In some cases the development of circulatory disturbances is more gradual, and takes place following over-exertion, if such is not excessive but occurs repeatedly. In chronic cases symptoms develop gradually and at first consist of cyanosis and prominence of veins, especially of the jugular, which exhibits a pronounced diastolic pulsation. This is soon followed by subcutaneous edema in front of the chest and under the chest and abdomen, the prepuce and extremities. Attacks of giddiness occur, horses frequently falling at exercise. Dilatation usually follows heart fatigue, as already pointed out, if it is of long duration or rather pronounced. If of old standing, there may be marked atrophy of the cardiac muscle.

Symptoms of dilatation are an increased area of heart dulness; the force of beat is increased, due to the greater portion of the heart being in apposition to the chest wall; the systolic beat is increased in force, the second sound small or absent altogether; the pulse is fuller, but may be intermittent.

Whistling

This condition is a very serious affection in horses associated with either the turf or the hunting field. If the hereditary character of roaring and whistling had been more generally accepted in the early days of horse rearing, no doubt our thoroughbreds and hunter stock would have been better off today. There appear to be two recognized degrees—either a horse is described as a "slight whistler," which probably implies that in his slow paces it is possible to detect a slight unsoundness and not at the canter or gallop, or *vice versa,* or else he is described as a "whistler," which would appear to cover all other degrees, however well marked. It may be so pronounced as to cause the subject serious inconvenience, or so slight that it is said not to "stop" him. Generally it is progressive, though some horses appear to go for season after season without appearing to make any more noise. General condition undoubtedly is a great factor, and many horses who are "thick-winded" when only half fit, would easily pass when racing or hunting fit.

Epistaxis

This may occur from one or both nostrils, the cause being apparently congestion of the blood vessels of the nasal mucous membrane resulting from violent exertion, especially in warm weather, or more frequently to hemophilia or to trauma. Adrenalin has almost a specific action in such cases. Epistaxis is

distinguished from hemoptysis, or bleeding from the lungs, by the blood in the latter case being foamy and always coming from both nostrils; moreover, there is accelerated respiration and even dyspnea.

Azoturia

The occasional occurrence of cases of azoturia in the hunting field, especially after a frost, is worthy of note as the rapidity of its onset and the alarming symptoms are the cause of the utmost concern to the unfortunate rider, who always imagines his horse has a broken back. In such cases prognosis is not too favorable. Cases have also been noticed where perhaps hounds have run fast and put their fox to ground and during the ensuing delay horses stand about and get chilled. On moving off, the horse will suddenly be noticed to go very stiff behind, its action becoming worse at every step, until progression is almost impossible; prognosis in such cases is hopeful.

Injuries

Injuries are unfortunately all too common in the hunting field; their name is legion and the causative factors almost as numerous. The most serious are fractures, because in the large majority of cases destruction is the only course to adopt. Delayed fractures are of common occurrence and incidents are numerous where horses have traveled considerable distances with one or both metatarsal bones fractured, with a pelvis fractured and even with a spinal fracture.

Causes of fractures may be sub-divided into predisposing and exciting. Under the first heading the present-day road with its super-slippery surface must rank first, and next the superficial situation of a bone, exposing it to violence. Exciting causes are external and internal violence. The commonest form of external violence is a kick from another horse, and of internal violence excessive muscular contraction, as may occur when a horse fails to clear a ditch and drops its hind quarters into it.

The pastern joint is one of the commonest positions for fracture and this ranges from a simple fracture or split pastern to a comminuted or multiple fracture, where the joint resembles a bag of shot, the latter being impossible to treat, whereas the former readily responds. The heavy falls which hunters and steeplechasers frequently experience occasionally lead to a fracture of the vertebral column, sometimes in the cervical region, but more commonly in the dorso-lumbar region. In cervical fracture death rapidly follows. In dorso-lumbar fracture the bones involved are usually the last one or two dorsal vertebræ and the first one or two lumbar. Paralysis of the hind quarters generally follows at once, the hind limbs are limp and project at right angles to the body, the muscles tremble and patchy sweating breaks out. In the animal's struggles the fore end is raised, but the hind quarters are incapable of movement. Behind the fracture both sensory and motor nerves are paralyzed and the tail hangs limp.

Falls in the hunting field or when chasing, which do not result in fracture of the vertebral column, very often result in serious after effects, though at the time the horse may appear none the worse. Stiffness of the lumbar muscles may be apparent the following day and may in time respond to treatment, but in many cases a definite weakness or loss of action is noticeable and the horse is never the same again. In such cases post-mortem examination reveals exostosis of the lumbar vertebræ.

Claudication

Lameness may be due to varied causes, or the cause may be obscure, but the immediate result is always the same, enforced idleness from regular work and resultant loss of condition.

Flexor Strain.—This is a common cause of lameness in horses doing fast work. The structures involved may be the perforans, the perforatus, the check ligament and the suspensory ligament—more usually of a foreleg. In flexor strain there is more or less injury to the sheath and in some cases it is mostly the sheath that is injured. Where the tendon is injured, twenty-four hours after there will be a thickening at the seat of the injury, extending perhaps for an inch or two. Where the sheath alone is affected

there is a diffused swelling over some part of the tendon, extending for several inches and perhaps from the knee to the fetlock. If pressure bandages are applied and an examination is made the following morning, the leg will be found to be quite fine, but if the bandage is left off and the horse exercised the swelling quickly returns. In flexor strain or strain of the check ligament, lameness is continuous until the strain is cured. In sheath injury, however, the horse may trot out sound, but lameness returns with exercise. Rest and treatment usually result in the tendon sheath returning to normal, but should the condition become chronic, though the tendons become fine, there will be a thickening of the sheath. Bowed tendon is the result of straing of the perforatus usually occurring a few inches below the knee. Perforans strain occurring near the knee or at the junction of the tendon and the check ligaments always causes acute pain, whereas if the injury is just above the fetlock lameness is not so well marked and the horse will probably be lame at the trot but will stand and rest quite level.

Prognosis in cases of strain of the perforans just below the knee is always unfavorable, but in other positions and in strain of the perforatus it is hopeful.

The commonest form of flexor strain in the hind limb is known as curb, which occurs at the back of the hock at the head of the metatarsus and involves the perforatus tendon. Sometimes the calcaneo-cuboid ligament and also the annular ligament of the hock are involved. A simple curb or one affecting only the perforatus may cause only slight lameness, which quickly disappears with treatment. In cases where other structures are involved and constituting a diffused curb, lameness is recurrent.

Navicular Disease.—This is a rarefying osteitis combined with roughening of the perforans tendon; the articular surface of the bone is but seldom affected. Heredity is the chief factor in navicular disease, though concussion is a contributory cause. A horse with navicular disease has no commercial value.

There is no exemption of the hunter or thoroughbred as regards diseases affecting the feet, so common amongst other animals, but it is noteworthy that the conditions under which they are kept seem to be more favorable than is the case in other horses.

Laminitis.—This may occur in hunters from over-exertion, long journeys, concussion and sudden chill; such cases, as a rule, can be described as simple laminitis. The symptoms diminsh in a few hours and usually by the third or fourth day the horse is well on the way to recovery. In such cases the foot does not suffer much, the only result being that the horse may go on his heels.

Shoeing.—Bad shoeing is responsible for many foot troubles, and negligence on the part of the stable lad or groom plays a similar part. An example of the former is the presence of a corn; of the latter, thrush.

Corns are very rare in unshod feet; consequently, shoeing is blamed as their primary cause. Concussion is also a prime factor which accounts for the frequency of their appearance in the fore-feet as compared with the hind. Conformation of the foot may predispose. A common cause of corn in a hunter is a stone accidentally fixed between the heel and the frog.

A corn remains aseptic as long as there is no breach in the horn to allow the entrance of infection. If the contusion is severe, the horn becomes infiltrated with serum and constitutes a moist corn. If infection ensues through an accidental fissure or from excessive paring, a suppuration or festering corn is the result.

Dermatoses.—Affections of the skin, such as mud fever, cracked heels, saddle galls, and also thrush, should not occur in the well-regulated stable. They are, in the large majority of instances, the result of carelessness. The same remark applies, though in a lesser degree, to the occurrence of over-reaches. While ready to admit that an over-reach will occur whatever precautions are adopted, many more occur because owners leave too much to their farriers with regard to the make and fit of the hind shoes. A concave shoe set well back involves very little extra trouble in the making and fitting, but its use is well repaid by the freedom from over-reaches.

New Method of Handling Eversion of the Uterus

By E. T. BAKER,
Moscow, Idaho

DURING the past twenty years we have treated several hundred cases of eversion of the uterus, mostly in the cow. Until about a year and a half ago, our mortality averaged around 40%. Most of our cases died after the organ had been successfully replaced and everted again, due to the severe straining, in spite of sutures, harnesses, pessaries, anesthetics and all kinds of contrivances.

Our first distinct advance was made several years ago, when we began to study the various complications, such as eclampsia, obstetical paralysis, milk fever, bloat, impaction and eversion. Prior to that time, we had always regarded eversion as more of a mechanical derangement, for there is very little literature on the subject of value in actual practice.

Usual History

THE great majority of our cases occur in the morning. Usually, the cow calves the day or evening before. Sometimes the delivery is easy; at other times it is difficult, and, in some cases, there is labor for some hours. The next morning, the cow is found with "the whole works out," as the client explains the situation over the phone.

Some cows will show considerable excitement; others merely "hump up," and devote all their energies to straining. A few will stand up, but more lie down, choosing the most filthy spot in the entire precinct.

Complications

As mentioned above, various complications, such as eclampsia, bloat, paralysis, milk fever and other assorted ailments may be present. All these help to start the day off in a bright and cheery manner.

Even when the animal has been put to sleep with a general anesthetic, and the organs replaced as normally as possible, the owner may call up in a few hours with the glad news "it's all out again." After making a few appropriate remarks to oneself as the phone is hung up, a return trip must be made and the whole procedure repeated.

"What causes this trouble?" we have asked ourself more than once, but the old cerebrum remained as silent as the corridor of a busted bank. And so we worried along for nearly twenty years, having very indifferent results.

With the advent of glucose and calcium therapy several years ago, we began a new line of experimentation. The question before the house was: Is the eversion due to straining, or the straining due to the eversion, or what may be cause of both?

Preparation of Patient

KEEPING in mind the human patient is always carefully prepared for an operation, if at all possible, why not use this same line of treatment in bovine eversion? Why not attack the so-called causative factors, and reduce the straining before even replacing the everted organ? Why not save our back and arms by some preliminary preparation of the patient, and spend a little time in studying the type of case with which we have to deal?

Answering these queries, we have worked out the following routine, which has given us very good success in the last dozen or so cases treated. We do not claim it is perfect, but it is such an improvement on the old methods that we think it worth giving to the profession.

FIRST of all, we will suppose we are called to see a case early in the morning, and find our patient standing up. We get her in as clean a place as we can, well bedded, and treat her for milk fever. One quarter grain each of atropin and lobelin is given, and then 250cc of a 20% solution of calcium gluconate is injected into the tissues of the shoulder. Next, we add a couple ounces chloral (carrying this much in a wide-mouthed bottle) to a pint of our bovine laxative, and give as a drench, if she can swallow readily; otherwise give on the tongue, carefully, with a dose syringe.

If the cow is lying down, we inject the solution through the trocar into the rumen with our stomach pump. In winter, where there is a chance of impaction, we add several gallons lukewarm water.

If the animal is up, we have the owner dig a hole in the dirt floor, about a foot deep, and several feet square, piling the dirt back so it will just about come under the belly. This is well bedded, and a couple poles placed on either side, with the cow in the middle.

WE THEN return home for breakfast or make another call, planning to return in about two hours. This gives our preliminary treatment a chance to work, and if she lies down, her hind parts are elevated.

If she is already down, we place several gunny sacks under the everted mass, and try to slip a sack of earth or grain under the belly. If she is "completely down and out," we place a box under the uterus, so as to raise it on a level with the body, and give the blood a chance to gravitate back into the general circulation. In very cold weather, a little frame work can be made, and a blanket placed over the organ, but not touching it.

Method of Replacing

RETURNING to our patient, we slip into our rubberized suit, with sleeveless shirt and high top overshoes. Everything is now prepared for immediate use when wanted. A bucket with several gallons lukewarm aromatic antiseptic is at hand. Uterine capsules are made ready. We carry an old hypodermic needle in a cork to puncture the ends of the capsules for more rapid absorption, and we like equal parts of iodized charcoal and boric acid about as well as anything we have ever used.

We now clean off the larger chunks of filth or straw from the uterus, but do not touch it with water. We next take a strong unbleached muslin bandage, about eight inches wide and five yards long, and wrap it around the organ, beginning at the lowest part and working towards the vulva. We

The author's home, March, 1933. A heavy snow in the mountains portends good crops in Idaho.

put this on fairly snug in an endeavor to push back the blood, if such a thing is possible. In some cases, we have omitted the bandage with good results, but we think it helps as a rule.

An assistant (usually the owner) now slips a gunny sack under the prolapsed organs, and holds it up level with the vulva. If we can, we may tie a rope to a joist and try to raise it up that way, or slip a wide board under it. Half the battle is accomplished if the cow is standing up, or lying down hill, with the everted uterus on a level with the vulva.

We wait a minute or two, and then rapidly unwind the bandage, taking it off. A paraffined mesh bandage might be ideal here to prevent any adherence to the membranes, but the muslin seems to be all right.

WE NOW begin slipping the organ back, or rather, "stuffing it in." When we get about half in, we slip our left hand in the fundus or the end hanging out the farthest, and push it back while feeding the upper edges with the right hand. We have threatened to get a Bittles' replacer about every time we have a case, but so far, like many other things, have put it off. We think it looks like a practical instrument.

If the cow is down and refuses to get up, we try to slip a sack of grain or earth under the belly just in front of the udder. A couple sticks of stove wood are now placed on one side, while a wide board is placed under the uterus, and raised up like a fulcrum. If in a corner, we can use a wide shovel, or anything to raise the uterus on a level with the vulva.

As the uterus goes back into place, we draw our left hand, and grasp the capsules with our right hand, and insert them on the floor of the organ. If the animal strains much, we keep our hand in for a minute or two, smoothing out the organ, and then gradually withdraw the hand.

WE NOW have our big surprise. As the arm is taken out, the animal ceases to strain, and assumes a more normal attitude. In some cases, she will attempt to strain, but not violently, and if given some grain or hay, may start eating. Formerly, if not completely under the influence of a general anesthetic, we had to watch her carefully, and even put in sutures to prevent a possible relapse.

We heartily agree with the NRA in reducing the hours of effort and raising wages, particularly as it applies to replacing a prolapsed uterus. If some of these politicians even try to replace an everted uterus in a big Holstein cow they will realize what work really is.

Summary

1. Prepare your patient for the operation, and give several hours for the sedatives and gluconate to act.

2. Do not wash the uterus or try to disinfect it in any way with liquid or powdered antiseptics. There is a protective mucin on the membranes that will take care of any dirt or infection. Recent investigations show the afterbirth or placental fluids are powerful germicides. Washing the uterus with a warm antiseptic removes this natural protection, and increases straining, just as does an enema.

3. Get the patient in a proper position, with the hind parts elevated. When we think of the cases we have had lying on their sides, and with us trying to push against these expulsive efforts, we feel as foolish as if we had played the stock market.

4. The preliminary treatment with the gluconate seems to reduce straining and shock. As it has an action for more than a day when given hypodermically, the after effects are reduced to a minimum. We think the new parathyroid treatment will be valuable in many cases, but so far, we have not tried it.

5. We tried amputating the uterus in one case. The operation was a success, but the patient was dead in twenty minutes.

6. After starting replacement, have everything ready, and work as rapidly as possible. The sooner the organ is replaced, the better for all concerned, including the operator's arms.

7. Out of the last dozen cases treated as above, all have recovered. Only a couple had any excessive uterine discharge; this was left alone, and nature soon took care of

it. Bolstering the vitality with the gluconate has a powerful effect and seems to allay nervous conditions. Also, the uterine capsules have a healing and non-irritating effect. Our whole effort is to assist nature, instead of to hinder her in our replacement program. Perhaps that is one reason why an owner occasionally has good success in "putting one back" with merely a good right arm and expressive profanity.

8. In a few weeks, depending on the financial condition of our client, about fifteen dollars changes hands.

9. Formerly, when we received a call to alleviate this condition, we felt like we were going to a funeral. About half the time, our "hunch" was correct.

10. While this treatment is far from perfect, it is the best and most successful we have tried so far. We expect more or less trouble, due to peculiar complications not fully understood at the present time. That is, we do not understand them, and we think other practitioners are in the same boat. However, it is remarkable how many of these obscure nervous ailments are controlled by calcium gluconate. In some cases, dextro-glucose, H.M.C., magnesium sulphate sedative or other agents may be indicated. Our first task is to reduce nerve irritability, and then, after replacement, nature will do the rest.

Home-made rack for milking machine teat-cups.

* * * *

Care of Milk Utensils

When a proper method is used there is no reason why a great amount of time should be spent in caring for the milking machine, nor why machine-drawn milk should not be of the highest quality.

The common idea that a milk utensil which is clean or which is in a condition that it will not injure the milk, will be the same twelve or more hours later is usually untrue. The effect of the utensil in decreasing the keeping quality of the milk may be magnified a thousand times by storage for twelve hours.

The ideal germicide must not be harmful to man nor injure the flavor of milk. It must not corrode the metal nor injure the rubber. It must be cheap, convenient to use and must not lose its effectiveness on storage.

As soon as milking is finished, draw at least three gallons of clean, cold water through each unit of the milking machine. Delay in rinsing tends to make the whole scheme a failure.

Place the teat cups in a rack so that all are held upright and at the same level. Clamp the long rubber tube so that its opening is up and at the same level as the very top of the teat cups. Fill with a 0.3 to 0.4% solution of lye.

Just before milking remove the long rubber tube from its holder, and allow the solution to drain from the parts. Then draw at least one gallon of clean cold water through each unit.

A milk can that has an odor is not fit to use without treating to destroy the bacteria in it. The simplest way is to rinse it with a solution of hypochlorite; this is on the market under a number of different names.—*E. C. Hastings and Geo. Werner, Wisconsin College of Agriculture.*

Horse Flesh a "Natural" Food for Carnivores

By L. J. BROSEMER
and JOHN ASHENHURST
Rockford, Illinois

THERE is a popular myth, possibly based on beliefs advanced by both French and German scientists in the early days of food research, that the meat of the horse contains some harmful element not found in other animals of the red-meat type.

When a scientist thinks he has hit upon a sensational discovery, the newspapers snap it up eagerly and the public swallows it whole. Later research may show it was all a mistake, but the newspapers have little interest in an anti-climax. They need their space for some new illusion of the day, so the real facts make no such stir as the original story. Usually it takes them a long time to trickle out to the general public.

The early scientific theories about horsemeat have been thoroughly disproved by later scientific facts, but the myth remains. A well-known writer on things canine—S. Boehm—probably aroused by a sort of "whispering campaign" that is going on against this very excellent meat food for dogs, has just raised the issue with a challenging article in one of the monthly dog magazines—Dogdom for May, 1933—citing a recent article by Dr. H. Loessl in a well-known German dog publication. We quote briefly:

"Dr. Loessl says: "The warning against horsemeat that, supposedly, contains harmful substances . . . is founded on an unfortunately often repeated and widespread fairy tale. Last year further experiments were made at the Agricultural College (Dr. Loessl, probably, refers to the Agricultural College of Berlin). Several groups of litters received as their meat supply, exclusively and plentifully, raw horse meat, from earliest puppyhood until complete maturity, and INVARIABLY, THE GREATEST SUCCESS WAS RECORDED. In its effect, the raw horse meat excelled all other kinds of meat equal in albumen, even if other kinds of meat were given in larger quantities. . . .

". . . scientific research work is always to be recommended and its findings are always of value, but it seems to me the plainest common sense would settle the question anent any detrimental effects of horse meat. There is no biological reason whatever why the meat of the horse should be more harmful than any other kind of meat. So far as I know, the wild animals of the Zoological Gardens of the world are all fed horse meat. If there was the slightest danger in this food, it's a cinch that these expensive and often rare creatures would not get it! Also, numerous of my acquaintances have fed horse meat to their dogs for years, and one of our best known and very widely used canned rations admittedly contains horse meat, and I have never heard that this product engendered any undesirable effects. Finally, horse meat is extensively sold as human food in foreign countries. . . ."

A criticism of science seems to be implied in the second paragraph. It does seem strange that science has been so tardy in putting its *imprimis* on the obvious success of a great many practical feeders—animal trainers, zoo-keepers, masters of fox hounds, and the like—who have used horsemeat, year in and year out, for generations. And the theories of the older scientists, who more or less "went off half-cocked," undoubtedly did much damage.

But let us be charitable, even as we recall lovable dogs whose lives were shorter because we knew so little about canine nutrition. We have many advantages over those scientific investigators of 30 years or more ago. We know now, for instance, that all food values are "supplemental"—that there is no one complete food for either man or beast; but that various foods "balance" each other, and the combination makes an adequate, well-rounded diet.

Thus when we read of how young dogs sickened and died on diets "composed exclusively of horse flesh," it is easy to understand how a priceless truth escaped those early experimenters. Had they tried *the same experiments with any other meat* as

the sole supply, *the results would have been the same*—or worse. So let us be charitable, rather than critical, and thank God that modern biological technique has given us more light on the subject.

Doctor Loessl's findings tie in closely with other discoveries which have been recorded lately in the same field. It is gratifying to observe that an increasing number of real scientists are giving attention to the problems of canine nutrition.

THERE are many interesting facts about horse-meat that the author, mentioned above, did not raise. For instance, he did not say that American biologists have recently credited horse-meat with a definitely higher nutritional value for dogs than beef; that geologists think horse-meat has been a natural food for dogs for at least 50,000,000 years; nor that a type of meat horse new to this age but similar to its unbridled, unsaddled ancestors of prehistoric days, is being raised in herds out west for the principal purpose of feeding modern dogs. Yet all these things, startling as they appear, seem to be true.

In discussing the "common sense" angle, for instance, he could have substantiated his statements by a glance at the history of the last 50,000,000 years. It by itself refutes the alleged "discovery" in the early part of the present century that there is some poisonous substance in horse-meat.

Geologists are very skilful in reading the "records of the rocks" written millions of years before man himself appeared on earth. The fossil record of the horse is the most complete of all the larger mammals, and suggests that it was one of the earliest meat animals to appear on our globe.

Evolution of the Horse

THE earliest known type of the species was the *Eophippus* (dawn horse), living on the western plains of America. He was very small, not much larger than a husky jack-rabbit, and he had four toes. Probably there was an earlier, five-toed ancestor, but so far his bones have not been found. We think of America as the "New World," but there is a comfortable assurance of its permanent character in the fact that the Eophippus was living here 55,000,000 years ago.

As the years rolled on (by the million), the horse slowly changed. He tended to walk on three toes, and the fourth one gradually ceased to function and then slowly vanished. So as recently as 30,000,000 years ago he was a three-toed animal, as large as a sheep, and known as a *Mesophippus* (intermediate horse).

But three toes seem to have been more than were needed, and the Mesophippus type came to depend more and more on the middle toe alone. Nineteen million years ago the two side toes had ceased to function, and by 7,000,000 years ago had finally disappeared. The animal with the useless side toes was about the size of a small pony of today, and is known as the *Merychippus.* At the next stage he is called the *Pliohippus* (greater horse). And by a million years ago his single toe had become a real foot, and the type begins to be known as the *Equus,* or true horse. Only two splint bones remain today as vestiges of the long lost toes.

Soon after the Pliohippus became the Equus, the species disappeared from the American continent, its home all through the long, slow evolutionary process. Science next picks up his trail in northern Asia, and assumes that the migration (across land not then covered with water) was caused by the great glacial movement of the Ice Age.

And that was the beginning of the million-year journey westward around the world. From Asia into Europe the horse advanced, one line going to the north and the other to the south. When man began to tame the animals and adapt them to his own uses (probably about 6,000 years ago) the horse was very different from the animal of that name we know today. He was a meat animal, so intended and devised by Nature, and used for food by man and beast until the former got the bright idea of enslaving him for other purposes.

Remote Ancestor of the Dog

HORSES, of course, were not the only animals involved in the slow but inexorable processes of evolution. No doubt they were among the first species of small, grass-eating mammals, but Dr. J. W. Gidley has established that even in the Eocene era there were carnivorous, or meat-eating animals, who lived to prey upon the grass-eaters. One of the most prominent of these was the *Miacis*, of which portions of the skeleton have been found, and which geologists point out as the ancestor of the modern dog. Thus scientists find the horse as a meat animal, and the dog as a meat-eating animal, from the earliest times—long before the ancestors of the cow, sheep, hog, or any other domestic animal had taken a form which would enable us to connect them with the common human meat-animals of today. These records of Nature, revealed by geology, seem to leave no doubt that dogs have been eating horse-meat for more than 50,000,000 years. And there are still a few dogs alive in the world today!

Horse Bred for Power and Speed

BUT to return to the later history of the horse in Europe. In the north, breeding was directed to the production of weight, strength and size. In the south, speed, grace and tensile strength were the qualities sought. The dramatic results of these centuries of man-controlled development are vividly seen in the contrast between the huge horses of the Crusaders and the beautiful, fleet steeds of the Saracens when they met in the Middle Ages on the hot plains of the Holy Land. Yet they differed from each other no more than they both differed from the common ancestor with which the diverging lines of breeding began.

The horse of the American western plains today is a descendant of those southern horses. The horse of the Saracens became the horse of the Moors, and was taken to Europe in large numbers when the Moors conquered Spain. The Spanish horse became the finest in the world. Spanish adventurers brought horses of this type when they conquered Mexico in the sixteenth century. A few escaped into the western part of what is now the United States. Home again!

It is from the horses of the Crusaders that the modern heavy horses of northern Europe descend. Some years ago the three Chappel brothers, experienced livestock men, decided to try an audacious experiment. They joined these two types, for the specific purposes of producing a meat horse —different from either type and resembling the ancient meat-animal from which both are descended. The experiment was completely successful, and now the offspring of thick-meated Percheron and Belgian stallions and light-boned western mares are being bred and raised in herds of thousands solely for their meat. The resulting cross has typical "hybrid vitality."

Uses of Horse Flesh

WHAT becomes of all this meat? It has many uses, but the chief of them is to supply food for dogs. Some of it is exported for human food. Liver extract and blood serums used in medicine are among other familiar products. Veterinarians say the horse is the healthiest of all domestic animals, and probably that is one reason why its products are highly esteemed as therapeutic agents.

In fact, it is said that this history of horse-meat in human medicine goes back to the days of Hippocrates, known as the "Father of Medicine," who lived in the fifth century B. C. He held that beef is indigestible, but that "horse-meat is lighter." In 1827 Doctor Larrey, chief of the medical staff of the French army, announced that he had found horse-meat excellent not only as food for soldiers, but also possessed what he thought at the time to be anti-scrobutic qualities. Scientists have discovered several medical qualities, and today practically all Paris municipal hospitals use generously of horse-meat, and the amount used, according to recent newspaper accounts, is steadily increasing.

Of course, these considerations have no direct bearing on the dog feeding problem, except that a meat in which so many bene-

ficial qualities have been found in human medicine would be expected, naturally, to have genuine nutritional value in feeding dogs . . . . as well as humans!

ANOTHER wide-spread use of horse-meat is in feeding commercial fur-bearing animals. Equine meat is still the natural choice of carnivorous animals, just as it seems to have been the "original" food devised for them by Nature, and the choice is expressed by the known preference of wild dogs, wolves, coyotes, mountain lions and bears for a colt. Explorers often comment on the fact that the zebra, an Equus, is the favorite food of the lion.

In studying the reports of scientific experiments, it seems that the points in which horse-meat excel as a meat food for dogs are its digestibility, its high content of proteins and mineral salts, and the amino-acid structure of the proteins.

Its remarkable digestibility is held to be due to the fact that, under the microscope, it is seen to contain a much smaller amount of fibrous connective tissue (myolemma) than other red meat. We have not the space here to quote scientific explanations of this tissue difference, nor to show how the amino-acid structure of the proteins in horse-meat is more suited to the dog's digestive system than that of any other meat. Later we will review the literature and recent experiments. But anyone who has given much thought to the science of nutrition will understand the importance of these points, as well as of the high-protein and mineral-salt content.

High Quality Available

ONE thing which seems to us even more important than the nutritive quality of horse-meat, especially as it refers to the individual dog-owner, is its availability for dog feeding and the *quality* of horse-meat one can get compared with the quality of other meats or "meat products" used in dog foods.

It is well-known that the red-meat sections (steaks, roasts, stews, hamburger, boiling meats, etc.) of the cow, steer and bull comprise practically 100% of the wholesale carcass sold to butchers, who in turn sell it at retail prices (along with liver and kidneys) for human consumption. The dog owner can draw his own conclusions as to what is left for the dog, even in government inspected foods.

This material should be at least clean and free from disease, as it comes from animals which have been certified as healthy by the federal inspectors. But it is hard to see how an adequate dog food can be made after the most nourishing portions of the carcass have been removed. What you get when you buy an *uninspected* food, only the gods can tell you. Anything may be used. Dr. J. W. Patton, a far-seeing and admirably courageous veterinarian, who made a special study of commercial dog foods, talked freely with us about eyes, udders, teats, noses, pieces of intestines, stomachs, lungs, ears, tails, bladders, condemned animals after cooking and dead animals, in the uninspected foods. It is not a pretty picture, but no manufacturer fooled Doctor Patton.

ON THE other hand, since horse-meat is not used for human food in this country, the makers of U. S. government-inspected horse-meat dog food has the entire dressed carcass at his disposal, and there is no reason why the red meat—tenderloins, porterhouse steaks, sirloins, roasts, boiling meats and the vital glandular material—cannot all be used in making a pure, wholesome, biologically adequate dog food. The big, boned chunk of meat from each side of the horse sent abroad for human food is no more adequate than the rest of the red meat sections and we doubt if it is

as tender as the steaks and roasts which go into the canned dog food.

Studies of Comparative Values

There has recently come to hand a very interesting account of some comparative experiments conducted by Dr. Laurenz Harris and Dr. E. R. Darling to determine the biological qualities of horse-meat and beef in feeding dogs, which corroborates the superior results obtained by feeding horse-meat to dogs as reported by Loessl. Perhaps these are as important as the tests of Doctor Loessl of the University of Berlin, for they actually match the two kinds of meat, cut for cut, pound for pound, in their effect on dogs. The report of the work and laboratory conditions leaves no room for doubt that the comparison is accurate and impartial.

Harris and Darling report that tests over a period of more than a year led to the conclusion that horse-meat has a more complete protein structure and more nearly approximates the requirements of a dog's body than beef. Furthermore, they found that the dog converted horse-meat into energy more efficiently than it did beef, so they unequivocally draw the conclusion that in canine nutrition, horse-meat has a higher nutritive value than beef.

SO WHEN we take it all together—the evidence of history, of medical science, of wild life seen in Nature, and finally, of biochemical science, which charts the actual work done in the dog's interior sections—it is hard to see exactly why or how the meat (especially so-called "meat") in any dog food is compared (from the standpoint of actual nutritional value) with fresh, red, government-inspected horse-meat, livers, kidneys, etc., used in good, biologically-assayed, truthfully branded canned dog food.

I think all of us who sincerely love dogs, and who are interested in giving them the best possible care, should thank our lucky stars that we are living in the twentieth century, when veterinarians and dog owners are interested in learning the truth about everything, and *intolerance* and *ignorant prejudice* probably are at the lowest ebb known in the history of man!

There are still many unsolved problems in medicine today, but it is not the laboratory worker alone who will solve these. The general practitioner has an equal field in these endeavors. American medicine owes much to the painstaking work of Sims in gynecology with his bent spoon handle as a speculum; to McDowell, in his country practice, who did the first ovariotomy; to Beaumont, in the wilds of the northwest, who so carefully examined the stomach through a gastric fistula, so that after a century the knowledge that he gave to the world still remains unchanged. A like opportunity is open to all, whether in the laboratory of a large city, or in country practice.—*Pharmacal Advance.*

* * * *

"The real progress in medicine advances as the oak grows; fashions spring up and dazzle and die like the poppies. We often meet the assertion that a medical book is out of date in five or ten years. The assertion is true only as it refers to customs and methods; as pertaining to actual movement forward, it is grossly inaccurate; discovery and invention do not proceed at any such pace. Indeed a work of genius is never out of date—Hippocrates is not out of date; Galen is not out of date; Avicenna is not out of date; Sydenham is not out of date. These are landmarks of medicine, sacred, inviolable, imperishable. A book of last year, however, may be out of date this year because it records nothing but passing fancies. A few modest volumes would suffice to chronicle the real achievements of medicine; a library is necessary to tell the story of medical speculation and practice. Truth is *forever* truth. Manners once really good are always good—there is no need for a man to change his manners every year or two in order to have good manners—there is nothing finer than an old fashioned gentleman. Bondage to fashion in medicine has two deplorable effects, it induces a blind faith in fads that is without power of discrimination; and it occupies time and thought that might be more profitably devoted to unsolved problems.—*W. B. Konkle.*

Minerals for the Dog

By RACHEL PALMER,
Gainesville, Florida

IT IS encouraging to the lovers of dogs to know that at last, out of the controversies concerning the dog's diet, new hopes are coming to light.

There is as yet little experimental data on the matter but what there is is conclusive proof that a dog can and does use all classes of nutrients. Indeed he does better on a mixed diet than on one limited to one or two foods alone, such as an all-meat diet, or an all-cereal diet, or an all-raw or an all-cooked diet.

Further, there is abundant evidence to show that living protoplasm cannot exist without minerals as well as organic constituents. The usual way of obtaining minerals is through the food.

The dog, biologically classed as carnivorous, has become by environment largely omnivorous like man; consequently his well being is dependent upon the six food elements: proteins, carbohydrates, fat, vitamins, minerals, and water. Some of these food nutrients are more important to him than others, depending on the size, age, and breed of dog, and climatic conditions.

Out of the six food elements the two that are apt to be deficient or lacking entirely in the refined foods so commonly used today are the vitamins and minerals. Vitamins were charted and published in the August, 1933, issue of *Veterinary Medicine*, pages 340-341. The following chart shows how minerals act in the system and how foods, as rich sources, may be chosen in the ordinary diet to supply those needs. Although the body is known to be composed of some twelve minerals only four (phosphorus, calcium, iron, and iodine) have been considered here first because, so large a percentage of the body is composed of phosphorus and calcium, and second, because if the four mentioned are present in abundance in the foods the other eight usually will be found also in sufficient quantities.

Minerals; Source and Distribution in the Dog

	CALCIUM	PHOSPHORUS	IRON	IODINE
Distribution in the Body.	Bones, teeth, skeletal tissue, blood stream.	In every cellular structure, bones, teeth, skeletal tissue. chromatin, cytoplasm, necessary in the neucleo-protein in every cell.	Hemaglobin; found in the chromatin of all cells. Indispensable to every active cell.	Thyroid gland and in thyroxin.
Uses in the Body.	To build bones and teeth, tends to foster a retention of iron (less iron is used by system if plenty of calcium is present) aids in coagulation of blood, aids contractility of muscles and response of nervous tissue to stimuli, is a coordinator among the other mineral element; aids rythmic heart beat, prevents overexcitability.	Part of every living cell, builds teeth and bones, helps maintain neutrality of the blood, aids proper liquid content of all tissues, aids in cell movement, is a factor in cell growth, found in the lecithin and helps cell to connect with the environment.	Aids in the reproduction; growth of cells; carries oxygen to tissues and carbon-dioxide to lungs.	Factor in normal growth; regulates energy and basal metabolism.
Deficiency Causes.	Rickets, decayed teeth, irregular heart beat and general body disturbances. weakness and soft bones.	Retarded growth; rickets; nervous instability. No cell division without phosphorus. Lack of appetite.	Anemia—lack of hemaglobin; no cell division or growth; increased respiration; accelerated heart action.	Metabolism low; growth retarded; changes in hair, skin and facial contours; healthy tissues are impossible; goiter develops; young born hairless; cretinism; apathy; dullness, and corpulence.
Foods in order of Richness.	Milk whole; turnips; milk whole, dried; cheese, American; oysters; milk, evaporated; cream 18%; cauliflower; muskmelon; rhubarb; carrots; milk condensed sweet; molasses; cottage cheese; navy beans; spinach; oranges; strawberries.	Buttermilk; salmon; milk; milk evaporated; chicken; corn canned; navy beans; graham flour; cottage and American cheese; white fish; milk, dried whole; oats, rolled; beef liver; oysters; eggs; tuna fish; cocoa; beef round.	Spinach; liver, beef; calf liver; beans, lima and navy; oysters (due to the element copper); molasses; apricots; beef,round; corn, fresh; rhubarb; banana; beets, fresh; prunes; dates; tomatoes, canned; muskmelon; figs; raisins; eggs; cauliflower.	Deep sea fish, lobsters, clams, oysters, salmon roe, salmon, cod, halibut and haddock yield 200 to 1000 parts per billion. Iodized salt and water. Fruits yield low about 25 parts per billion.

A New Method of Treating Genito-Urinary Diseases in Small Animals

By R. H. SPAULDING,
White Plains, New York

ABOUT a year ago Dr. J. N. Frost,[1] of the New York State Veterinary College, published a report of his experience in the use of a new antiseptic, known as Azamine, in the treatment of open wounds, vesicular vaginitis, metritis, retained placenta, coccidiosis, influenza and mastitis. Since that time I have been using this preparation in my practice in genito-urinary diseases with such gratifying results that I have thought it worth while to report them to the profession.

Many of you may by this time be familiar with Azamine. It is an azo dye of the pyridine series occurring as a fine brick red powder, soluble in boiling water, glacial acetic acid and glycerine. It is available for small animal use in 1/3-grain capsules for oral administration, in 2.2-grain tablets for the preparation of aqueous solutions for hypodermic use, and in a 10% ointment. Since the efficiency of Azamine is somewhat impaired if brought in contact with minerals, aqueous solutions must be prepared with distilled water in glass or enameled containers. A 2.2-grain tablet added to one ounce of water makes a 0.5% solution, the strength which has been found most satisfactory for general use. In making a solution the water is first sterilized by boiling and while it is still at the boiling point the Azamine is added. If the tablets are reduced to a powder, a solution will result almost immediately. This solution is not stable since the Azamine slowly precipitates, after several hours. It should be prepared freshly when used. (However, by heating an old solution to the boiling point the precipitate will redissolve without much loss of value.) Azamine can be suspended in oil, and while there is a tendency for it to precipitate, this occurs slowly.

[1] Frost, J. N., A Preliminary Report on a New Antiseptic Dye, and Its Chemo-Therapeutic Uses; *Veterinary Medicine*, Vol. XXVII, No. 9, pp. 372-3, September, 1932.

Azamine is a powerful bactericide, especially against organisms of the cocci and *B. coli* groups. It penetrates deeply and rapidly through denuded surfaces and mucous membranes. It is absorbed into the system rapidly and eliminated principally through the urinary tract. It is non-toxic, non-irritating, and has no cumulative action when administered in therapeutic doses. When given intravenously it appears in the urine in about 30 minutes. Injected subcutaneously it appears in the urine in about an hour, and by oral administration in three to four hours. The oral dose of Azamine is 1/3-grain three or four times a day for an 18-pound dog, other size dogs in proportion. For subcutaneous and intravenous use 1cc of a 0.5% solution is given for each pound of body weight. However, this is subject to great elasticity to conform with the seriousness of the condition being treated. A 1/3-grain dose given twice a day will show definite results in certain cases, but when necessary it may be given as often as every two hours. Intravenously I have given 6.6 grains to a grown collie, twice a day for three days, before undesirable reactions were seen.

Metritis

I HAVE used Azamine in every form of metritis except chronic pyometra. The first case which I treated was an acute endometritis following parturition and was the most severe case I have seen in years. A fox terrier bitch whelped four puppies uneventfully on a Thursday and was given a dose of castor oil according to our established custom. On Friday the dog did not

act very lively nor did it eat well and during the night whelped a dead puppy. The owner felt that she was then certainly finished and Saturday morning gave her another dose of castor oil and went to a dog show. On returning at midnight the owner found the dog very low, but I was not called until morning. When I first saw the bitch she was unable to stand. Her temperature was below 98° F., the pulse was feeble and thready and the skin had lost its elasticity. There was a profuse fetid purulent discharge from the vagina. The uterus was very large and hard. Two of the original four puppies had died and the other two were failing rapidly. The bitch looked as though she was going to die. I gave her a dose of pituitary extract and later injected the uterus with three ounces of a 0.5% suspension of Azamine in mineral oil. Orally I administered ⅓-grain Azamine with a heart stimulant every three hours. On Monday morning the temperature was 103.5%, the dog acted much better, was on her feet and ready to eat. The discharge was beginning to turn cherry red in color and viscid in consistency. It had entirely lost the putrid odor. The uterus showed more evidence of tone. I had intended to repeat the uterine injection, but because of the favorable response, decided against it, merely continuing the oral treatment. Tuesday morning, or 48 hours after I first saw the case, the owner reported by phone that the temperature was normal, the discharge normal, appetite excellent and spirits good and from this point she progressed as any bitch after a normal whelping. The owner disposed of the dog some time later and last month obtained for me a report on her subsequent behavior. She came in season in an ordinary manner at the proper time, was bred and whelped five puppies unaided and without after trouble. I have subsequently treated with Azamine, in the same way, about twenty cases of acute endometritis of varying degrees of intensity with the same excellent results.

Another representative case occurred in a cocker spaniel having septic metritis six weeks after her period of season. I gave her ⅓-grain of Azamine every four hours accompanied by a hot saline douche to promote discharge. In 48 hours, when the discharge had started, I injected the uterus with Azamine in the form of a 0.5% ointment. The operation however was not successful and we were only able to get about ½ ounce of the ointment into the uterus. The discharge stopped completely in 12 hours and it was necessary to repeat the vaginal douches to reestablish it. When this was accomplished I decided to depend solely on the oil treatment. This was continued for a period of about two weeks before the uterus was in an entirely normal state. At her next period she came in season normally and at the proper time. Six weeks later I had the opportunity of examining her as I did again at the nine-week period, and at each examination the uterus was absolutely normal.

I have an English sheep dog kennel where septic metritis is very prevalent and since using Azamine I have had the opportunity of treating three such cases, one of which was very severe. This bitch had a false conception, and in treatment we gave her small doses of Azamine ⅓-grain daily over a perioid of about two weeks. Immediately after her next period of season she developed septic metritis with symptoms fully as severe as those in the fox terrier, which I have described. She was given two ⅓-grain capsules of Azamine every three hours together with such supporting treatment as was indicated, and recovery was much more rapid than we have ever experienced in these cases before. She has since been in season normally without a reoccurrence of the metritis. The other two cases readily responded to oral treatment.

Abortion

I HAVE had two cases of abortion, one in a Scotch terrier in which ten puppies in an advanced stage of decomposition were delivered normally in less than ½ hour. I gave her a ⅓-grain capsule of Azamine at four-hour intervals. The temperature when I first saw her was 103.5° F. Eight hours later the temperature had dropped to 99.5° F. and stayed there for

several days. The discharge was at first very copious and putrid, but in 24 hours time it had changed to a yellowish color and the quantity was rather scant. It never did become normal in character insofar as I was able to find out. The dog did not eat well for four or five days and her spirits were very low, but gradually she came back to normal. Two weeks ago I was able to palpate the uterus and found it normal.

Another Scottie had a premature delivery of four live puppies, on the fifty-fifth day. They subsequently died. I saw her after the first puppy was delivered and her temperature was 104° F. She was given ⅓-grain of Azamine every four hours. In 12 hours time she had delivered the four puppies and her temperature was down to normal. She made an uneventful recovery and has since been in season normally.

A sealyham terrier presented a very unusual and interesting case. She had been in season six weeks previous and had found herself an acceptable mate. When I was called there was a terrific distention of the abdomen and she was very restless and at times seemed in considerable pain. Her temperature was normal and there was quite a copious discharge of grayish brown mucous from the vagina. The condition looked as though she were about to abort. I gave her ⅓-grain of Azamine every four hours and small doses of milk of magnesia. In twenty-four hours I received a report that she was much more comfortable, was eating well and the discharge was much less noticeable. Two days later the owner reported that the bitch seemed to be normal. She whelped four live healthy pups at an approximately normal time.

Gangrenous Mastitis

AN UNUSUAL case happened in a three-year-old English setter. She whelped six puppies normally and forty-eight hours later showed such alarming symptoms that I was called in. The bitch had not been given castor oil after whelping, a practice which I find is very essential, especially in a normal whelping where the placentae are consumed. The owner had given her all the food she could coax her to eat and the bitch was so interested in her puppies that she had hardly left them at all to take care of herself. The bitch was very disagreeable when I tried to examine her, making it hard to do so properly. She had a temperature of 104.5° F., the uterine discharge while not normal was not of a bad character. The breasts were very large and two of them were inclined to cake. I gave her a dose of pituitary extract, epsom salts, and ⅓-grain Azamine every four hours. The breasts were massaged gently with warm olive oil. All food was withheld for eighteen hours and then given in small quantities. Two days later the owner reported that while the bitch acted very well there was a terrible odor the source of which she was unable to find. On examination I found that one breast was necrotic. This was the third case of this condition which I have seen in my experience in practice. I removed as much of the necrotic area as I could without cutting healthy tissue and applied a pack of Azamine in aqueous solution. I also gave her an intravenous injection of 4.4 grains of Azamine. Twelve hours later I removed the pack and the wound looked so clean that I left off the bandage and treated it as an open wound. Her temperature was normal and general conditions so favorable that I put four of her puppies with her. She received subcutaneous injection of 2.2 grains of Azamine on the two succeeding days after which time further treatment seemed unecessary. She recovered nicely and is now in whelp.

Genito-Urinary Infection in the Male

ANOTHER interesting experience occurred in a twelve-year-old setter dog who had had a large pendulant testicle for years. At the time of treatment he showed evidence of infection as indicated by a loss of appetite, temperature, listlessness and a discharge from the eyes and nose. The urine was reddish brown in color, profuse in quantity and had a very fetid odor. It obviously contained great quantities of pus. He was given an intravenous injection of 4.4 grains of Azamine twice a day for three days. In less than forty-eight hours time the urine was normal so far as

could be determined by observation. The temperature was normal, the appetite ferocious and spirits good. Because of the age of the dog an operation was not deemed practical and he was destroyed. The quick response to treatment which was shown in this case demonstrates well the effectiveness of Azamine as a bactericide.

An airedale about 10 years of age had for several years been periodically passing a whitish discharge in the urine. He had on previous occasions been successfully treated by a colleague of mine, but finally, last fall, the treatment failed and he was eventually brought to me. The dog was thin, the skin in bad condition, and in many places entirely bald, the coat very thin. His general condition was poor, he was listless, had no appetite, and his temperature was 103° F. The abdomen was pendulant and on examination I found an enlargement about midway between the angle of the ileum and the last rib, which consisted of two sections, each about the size of a tennis ball. The discharge was flowing so freely that it was necessary to keep a bandage around him to retain the discharged material. In response to my call for a sample of urine the owner brought me a pint bottle the lower half of which contained a yellowish white fluid about the consistency of light cream the upper half was what appeared to be normal urine. I sent this to the Veterinary College at Ithaca for analysis and the report showed only minor changes in the urine except for the presence of tremendous quantities of leucocytes. Dr. C. E. Hayden of the College, could not suggest the source of these. After consulting several physicians I had decided that the enlargements were tumors, probably fibro-sarcomas which were in the stage of disintegration and were emptying into the urinary tract.

The fact that the dog has never had any difficulty in urinating, nor retaining his urine, leads me to believe that the tumors were not attached to the bladder, but to one of the ureters. The animal's age precluded any attempt at surgery. In treatment I began giving two ⅓-grain capsule of Azamine three times a day, and the response was evident in 48 hours. The dog began to eat with relish and his spirits improved. In three weeks time the physical condition of the dog was noticeably better. Six weeks later the quantity of the discharge had become greatly decreased and by four months time it had almost entirely ceased. For a time during the early part of the treatment I increased the dose to three ⅓-grain capsules a day and as the improvement became evident the dose was decreased until now he gets only three or four ⅓-grain capsules a week. The tumors have decreased in size about one-third. The dog has put on weight, is as active as a five or six year old dog and has grown a new and excellent coat.

About three months ago I had an interesting experience with a male airedale about twelve years old. The owner claimed that for some time the male dogs in the neighborhood had been following the old dog as though it were a female in season, to such an extent that the neighbors were complaining of the nuisance. He appealed to me for help. I had never before been confronted with such a case and was at a loss to know what to do. The dog seemed to be in excellent condition and there was no evidence of any disturbance of the urinary or genital organs so far as I could see. There was not even the occasional discharge from the penis so often seen in old house dogs. I noticed an odor arising somewhere in the genital tract, possibly from the prostate. An antiseptic treatment seemed to be the most feasible so I gave one ⅓-grain capsule of Azamine three times a day. Last week I called the owner and he reported that the treatment had been immediately effective and that after continuing it about a week, the response had been permanent in the absence of the odor and general improvement of the case. Apparently the causative disturbance had been eliminated.

Urethral Culculi

I HAVE operated on four dogs with urethral calculi in which I have flushed the bladder with a solution of Azamine and then

maintained oral administration over a period of time afterwards. Three of these cases have not shown any reoccurrence of the trouble so far. The fourth was a tiny Yorkshire, weighing less than four pounds. His bladder apparently contained a great number of large stones, but because of his size the flushing of the bladder was unsuccessful and as a result only a short time after the first operation there was a new obstruction, necessitating a second operation, which proved to be more than the little fellow could stand.

I have had one cat with calculi in the bladder. There was no obstruction in the urethra, but frequent straining and micturition was seen and at each attempt only a small amount of bloody urine would be passed. When this dried on paper a thick deposit of fine sand was left. The cat was given ⅓-grain of Azamine three times a day and in three or four days evidence of the gravel ceased. The treatment was discontinued and the bladder condition became evident again in a short time, so the cat was kept on one or two ⅓-grain capsules daily over a period of a month or so and to date there has been no further trouble.

I AM using Azamine now as a routine treatment in all cases of whelping where any interference makes it necessary to aid in the delivery of puppies even though only a dose of pituitary extract is used without manual exploration or manipulation. In most cases of uterine infection oral administration of Azamine will suffice except where the degree of infection is sufficiently intense to cause a high temperature and prostration. In my experience in the past I have found an inflammation of the uterus very hard to permanently overcome, and reoccurrences of the infection, even though only slight, have seriously impaired the breeding efficiency of our animals. Azamine promises to be a means of effectively eliminating this trouble. In every case where I have used Azamine in the genital tract the results have been very satisfying. I have not had the opportunity of treating a case of pyelitis or primary cystitis but I can see no reason why the same results should not be expected in these cases.

Conclusion

FROM my experience so far I believe Azamine to be the best genito-urinary antiseptic which has yet been made available to the veterinary profession. Because of the rapidity with which it is absorbed, the promptness with which it destroys infection, and its apparent affinitiy for the genital tract, makes this type of treatment far superior to the old method of local treatment. A more extended use of this preparation may show that its application will serve in a much wider variety of uses.

* * * *

Caesarean Operations

In my observations and contacts it seems to me that too much stress is placed on caesarean operations; especially in dog practice, which results in no credit to the profession. Fortunately this is far from being general but it is sufficiently common to warrant comment.

Looking back over twenty years of practice in which my associates and I have attended many obstetrical cases in dogs and cats, I can recall only a few that needed a caesarean.

In the cases that needed a caesarean—that had an injured or deformed pelvis and where it would have been unwise and inhumane to have allowed them to breed again, we did a complete hysterectomy; ligating the stump with braided silk, painting the exposed part with carbolic acid and wiping this off with a cotton swab dipped in alcohol, the same technic I have advocated with a cecal stump. The ovaries too, were removed.

In cases where the bitch had been in labor for some time, the pups dead, bloated and their coats dry, a modified caesarean was performed, i. e. the patient was prepared and anesthetized as if for a caesarean, an opening made into the abdomen, uterus examined, the operator's hand inserted into peritoneal cavity to guide a rubber catheter which was inserted *via* the vagina and through which mineral oil was injected to lubricate the fetus. The catheter was then

withdrawn and obstetric forceps guided into proper position. By manipulation of the uterus over the fetus and the forceps delivery was made, the same *modus operandi* was repeated until all fetuses were delivered; then the peritoneum and muscle was sutured with chromic catgut and skin and fascia with silk. An aseptic gauze pad was fixed over the wound by adhesive bandage.

However with all but a few of our obstetrical cases, the practice of patience, allowing nature to have a fair chance, assisting when necessary by digital manipulation of the abdomen and external area over the vaginal channel and where needed using forceps delivery, has been sufficient. With time we improved our technic and adopted the system of handling obstetrical cases, only at the hospital. Cases handled at the home do not average as satisfactory as those treated in the hospital.

This article was suggested by my reading in *Time* magazine about Dr. Palmer Findley's book "The Story of Childbirth," published a short time ago.

Doctor Findley is professor of obstetrics and gynecology at the University of Nebraska's College of Medicine, councilor of the American College of Surgeons, one-time president of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons.

In his book he warns expectant mothers to beware of obstetricians who are prone to caesarean operations. Stating caesareans are spectacular operations, that make the surgeon feel proud, but they are dangerous and in 95% of deliveries a skilled obstetrician need only help nature.

It occurred to me that one might sound similar warning to veterinarians, some of whom are too prone to caesareans. It is better that the warning come from within our own ranks than for outsiders to be the first to bring the matter to public attention.

J. G. Horning,

Houston, Tex.

Do You Remember?

1. Question.—What is the circle of Willis?

Answer.—The circle of Willis, also known as the circulus arteriosus, is an arterial circle usually encircling the pituitary body and the optic chiasma at the base of the brain. It is formed from branches of the occipital and internal carotoid arteries.

2. Q.—What is the end product of the digestion of simple proteins in the body?

A.—The end product of the digestion of simple proteins in the body is the amino-acids of which seventeen are known, or of combinations of these acids—peptids.

3. Q.—How does (a) the intradermal vaccination of attenuated cultures of anthrax bacilli compare with (b) the subcutaneous inoculation of virulent anthrax bacilli suspended in 10% saponin?

A.—In one experiment, the results were in favor of the intradermal vaccination, although the subcutaneously inoculated animals escaped infection.

4. What is the most vital part of the brain?

A.—The medulla oblongata or bulb is the most vital part of the brain due to its being the center of the more important functions such as respiration, circulation and most of the digestive system, and minor functions.

5. Q.—What is the reticulo-endothelial system?

A.—The reticulo-endothelial system is a group of cells closely related to the mesenchyme and which are readily stained intravitally. This system is composed of two types of cells—the free, wandering type which is chiefly phagocytic, and the fixed type which includes some endothelial cells, possibly the microglia, and those cells which form the reticulum of some organs such as the marrow, lymph nodes, and especially the spleen. Functionally, it is concerned chiefly in phagocytosis, metabolism and blood formation and destruction.

Wesley O. Keefer,

Akron, Ohio.

The Lady and Her Dog

IN SEVERAL countries of Continental Europe, certain exhibitions have found much acclaim in recent years. In a way, these exhibitions were dog shows, but they offered the old, time-worn institution in a brand-new form that proved highly pleasing to the public and, according to reports, drew crowds such as were never seen at the regular fixtures. The events were advertised under the title "The Lady and Her Dog" and, eventually, a club bearing this name was organized in Berlin. Every year, at the beginning of the spring, this club stages its great show and the enterprise has grown to astonishing proportions. The original purpose of the shows was to award prizes to the woman and dog who offered the most harmonious and pleasing picture. In other words, the woman should be dressed so that the color scheme and style of her costume fit her charge. The best society has become much interested in the idea which is sponsored by leading artists and the luminaries of the stage and film. The orthodox canine organizations are inclined to look at these shows askance, as the pure-bred dog has to share the stellar role with its owner, but the attitude is changing and some of the foremost doggy writers are raising their voices to point out the immense value of these exhibitions in gaining new recruits (and, incidentally, customers) for the sport of dog breeding.

While in the beginning only the combination of lady and dog was offered in competition, several subdivisions have now been adopted. At this year's affair, which was held in the immense hall of the Berlin Zoological Gardens, the following "classes" were presented: "The best dog," "The dog that, so far, has won no prize," "The lady and the dog," "The child and the dog." Special awards were offered for the best wire-haired fox terrier, for the best cared-for Scottish terrier, for the smallest dachshund and for the best Pekingese. Well known all-rounders adjudicated the first class (the best dog), and a committee of artists passed on the group, "The child and the dog." But "The Lady and Her Dog" division was judged by the public, by votes. You can imagine the interest this created! I had in my possession a picture of the first winner in 1932. This was a magnificent Great Dane, all black, and his owner was dressed in white, trimmed with black. The whole made a study in black and white of surpassing beauty.

One of the purposes of our dog shows is, or should be, to attract new blood to the sport. I think we are failing lamentably in this design. For the outsider, an old-fashioned dog show is about the most pokey, uninteresting thing one could well imagine. The casual visitor doesn't know what it is all about, walks around with a bored, lost air and very soon leaves, feeling that his admission fee was wasted and that he got nothing for his money. As regards a desire for participation in the game, this, I venture to say, will not have been aroused in one case out of a thousand. With "The Lady and Her Dog" scheme, however, something really spectacular is being offered. The young couple who have drifted in to pass an afternoon or an evening, do get "an eye full." They understand the purpose of such an exhibit. They see something beautiful and attractive, they comprehend what the prizes are awarded for and, probably, will clap and "holler off their heads" in support of their favorites. And —what is for us most important of all— there cannot be a question that the wish to own a good dog has been powerfully stimulated. The young woman spectator will, undoubtedly, see herself leading in competition a Russian wolfhound, or a Scottie, or a poodle, or whatever may be her penchant. And from the possession of a good dog to the breeding of pure-breds is only one short step!

There are also organizations that offer similar exhibitions in the form of "The Dog

in the Auto." Automobile firms, of course, are mostly interested here, but the value to pure-bred dog breeding is evident in these spectacles, too. The astonishing part is that hustling, progressive America has permitted old-fashioned Europe to steal a march on her. The staging of such shows would be a typical American enterprise, something for a go-getter to make a name with. But as the chance to be leading in the field has been missed, the next best thing is to follow. And perhaps it wouldn't be a bad idea if, for a starter, similar exhibitions would be instituted as a "side show' 'at some of our major fixtures. The mouth of every superintendent should water when he contemplates the gate that would result from such an enterprise. My advice to all live American dog clubs would be to give the matter some serious consideration.—S. Boehm in *Dogdom*, 34:5, July, 1933.

Beef and Dairy Types Differ Chiefly in the Amount of Flesh

Five years ago, Sweet and Graves of the Federal Bureau of Dairy Industry, published a comparison of the conformation, anatomy and skeletal structure of two cows representing the highly specialized dairy and the highly specialized beef types.

Although these cows were found to differ greatly in external form, the difference in weight and size of their internal organs was not sufficient to indicate significant differences in function and their skeletal structure was strikingly similar in most particulars.

Except for the extreme difference in external form, the quantity of secretory tissues in their udders was the most striking difference noted.

These findings lead to the conclusion that the evolution of the dairy and beef types which has been accomplished through breeding and selection over a period of many years, has not materially altered their skeletal structure. The difference in type is due to extreme fleshing of the one and to udder development and the absence of fleshing of the other.

In other words, when we speak of an animal as being of the dairy type or of the beef type, we do not refer to any essential difference in the conformation or structure, other than a difference in the amount of flesh carried and udder development.

THE same authors have published recently a comparison of the conformation, anatomy and skeletal structure of the cow and bull of a dairy breed, and again they find no differences in the size of internal organs sufficiently great to indicate significant differences in functional ability. The skeletal structure on the whole, of the cow and bull is very similar. About the only difference being in the size and shape of the pelvis and in the width of the cervical vertebrae and of the facial bones. The differences which exist in the appearance of the animals are to a very great extent due to differences in muscular development and fleshing. The bull is not lighter in the hind quarters than the cow but only appears so because of the great muscular development in the fore quarters and neck.

SCREW WORM ATTACKING LIVESTOCK IN THE SOUTHEAST FOR FIRST TIME

A serious outbreak of the screw worm fly in Florida and Georgia is alarming livestock raisers in the Southeast, where this fly has never been an important pest, as it has been in the Southwest. This fly is present every year in the Southern States, but usually not in numbers large enough to cause them to attack living animals. The weather this year is probably responsible for the large screw worm population there.

Screw worms normally live in carcasses of dead animals. The flies that develop from these worms are greenish-blue, with three dark stripes on the back between the wings. The head is a light red, and rather large, giving them the name "red head" in some sections. When numerous enough they lay their eggs on injured

places on living animals. The larvae, which hatch in about 12 hours, penetrate the healthy tissue, causing pain and irritation, and if numerous may result in generalized septicemia. They may permanently maim the animal, or cause its death. Scrow worms often attack newly branded or dehorned livestock. Not uncommonly they penetrate the flesh through a very slight scratch or bruise, or they may enter through tiny abrasions where ticks have been attached to the skin or flies have bitten, and of course through castration wounds, wire cuts, etc.

The most important single step in control is the elimination of all possible breeding places for the insect. This means that all dead animals must be promptly burned and all animal refuse around slaughter houses burned or buried deep.

The number of flies already present can be reduced by setting out screen traps. These traps, baited with meat or slaughter house refuse, will catch incredibly large numbers of flies seeking food or places where they can deposit their eggs.

Every effort should be made to protect livestock from attack. This calls for avoidance of all injuries and no branding, dehorning or castrating during the fly season.

The treatment of the individual animal both before and after infestation with screw-worm is the same and consists solely in the prevention of infestation or reinfestation. All attempts to destroy the larvae after they have gained access to the tissues are futile, and the use of benzine, chloroform, creolin solution or other irritants for this purpose are distinctly harmful.

Within an hour after the larvae gain access to a wound, they have burrowed into the tissue beyond the reach of any agent not sufficiently caustic to destroy a great deal of tissue. The larvae burrow into the flesh for about three days, often reaching a depth of one inch to one and one-half inches in this period. At this time, when they are nearly grown, they turn and burrow their way to the surface, drop off and pupate. The larvae that benzine or other irritants kill when applied to the wound, are these mature larvae that are already harmless so far as that wound is concerned.

A wound infested wtih screw-worm larvae does not heal but continues to increase in size by sloughing and to exude a sanious discharge proportionate in amount to the degree of infestation. Screw-worm flies are much attracted by this discharge and continue to deposit eggs in the wound in larger and larger numbers as the wound increases in size and the discharge increases in amount. When the screw-worm larvae in the wound reach any considerable number, the animal begins to show evidences of toxemia and death soon follows if the deposition of eggs in the enlarging wound is not interrupted. Currettment of such a wound reveals larvae of all sizes from that of a pinpoint to worms a third of an inch long.

Few of the fly repellents, effective against ordinary flies, are useful in the prevention of infestation of wounds by screw-worms. The most irritant agents are, of course, unsuitable to apply to the wounds. Pine tar, recommended by the U. S. Department of Agriculture, is effective only so long as it covers the entire wound surface, which in the case of a discharging wound, is not more than an hour or two and may be for only a few minutes after it is applied. In the case of fresh wounds, it is never sufficiently long to be effective. So, it may be said to be wholly useless just as the treatment recommended by the Department (benzine) is wholly ineffective.

Possibly the simplest non-irritant, effective repellent for the screw-worm fly is a mixture of one dram of turpentine, one dram of liquefied crystals of phenol and two ounces of olive oil. This is disliked by the adult flies and reasonably effective against them if applied liberally around and over the wound once daily. In valuable animals and in areas where screw-worm flies are very prevalent, it is a good precautionary measure to apply it twice daily—in the morning and in the late afternoon.

Large, open operative wounds and ex-

tensive wire cuts are best protected by screening the animal. The discharge from such wounds is always sufficient to expose some part of the surface to attacks by screw-worm flies and it is exceedingly difficult to prevent the infestation of wounds by bandaging, since any portion of the bandage that becomes moist or any part of the discharge reaching the margin of the bandage constitutes an invitation to *Lucilia macellaria.*

It should be remembered that the attacks of screw-worm larvae are very different from the attacks of that of the ordinary maggot of the common blow fly and flesh fly. These maggots progress by devouring the tissue as they go, and never burrow into the flesh as do the screw-worm larvae. The wounds do not have an unhealthy appearance, are not infected with bacteria and the animal does not suffer from toxemia or generalized septicemia. Death when it occurs is a result of the penetration of a vital part by the maggots.

They may occur in the wounds in vast numbers. Channels may extend long distances, as much as four feet, from the original site of infestation. For example, an animal with a small wound on the shoulder may have a channel extending under the skin to the flank and as much as two gallons of maggots there, and yet show little evidence of the infestation.

Such wounds heal readily when the maggots are removed, as they may be by flushing out with a hose or by a currette or with the hand. Irritants such as turpentine, creolin or benzine are not particularly useful even against these maggots since the maggots should be removed, not killed and left in the wound.

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Milk is the great factor of safety in making good the deficiencies of the grains which form and must continue to form the principal source of energy in our diet. Without the continued use of milk not only for feeding of our children but in liberal amounts in cookery, we cannot as a nation maintain the position as a world power to which we have risen.—*E. V. McCollum.*

Vitamin C Lack Connected With Cataract of Eye

Lack of vitamin C, the scurvy-preventing principle, may have something to do with the occurrence of cataract of the eye, in the opinion of Prof. H. K. Müller of the eye clinic of the University of Basel, Switzerland.

Rabbits to which Prof. Müller fed doses of naphthalene, the smelly stuff mothballs are made of, developed cataracts. At the same time, the vitamin C which is usually present in the aqueous humor of the eye disappeared. Prof Müller has reported his discovery to *Nature.*— *S. N. L.* 24:648.

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Chlorine a Valuable Disinfectant

Chlorine acts partly by oxidation and partly by a direct chlorination of the bacterial cells. In some ways it comes very close to being an ideal disinfectant. Water may be treated with sufficient chlorine to destroy disease-producing germs without injuring its value for drinking purposes. Over 75 per cent of the domestic water in the United States is now chlorine-treated. Gaseous chlorine is not practical to use on the farm, but many preparations of stabilized hypochlorites are on the market, and they can be purchased economically in either the liquid or in a powdered form. These yield available chlorine in the presence of organic matter and are a very satisfactory source of chlorine. Their germicidal action is very rapid. Unlike potassium permanganate they do not leave a poisonous residue or a stain. The greatest field of usefulness of the hypochlorites is in the dairy industry where they are used to reduce bacterial contamination and sterilize milking machines and other dairy equipment. The surfaces to be disinfected should be relatively clean. The hypochlorites have proved very efficient in killing the bacillary white diarrhea germs, even when moderate amounts of chicken manure were present. In fact, all forms of chlorine are effective against all types of disease germs except those of the tuberculosis group—*Cir. 126, Wisc. Exp. Sta.*

Proventriculitis in Chickens Due to Flukes

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ON AUGUST 22, 1933, one of us (Stout) visited a farm near Craig, Colorado, for the purpose of determining the cause of loss in some eight-weeks-old White Leghorn chickens. At that time, out of 42 originally purchased, 29 had died. Out of a lot of Rhode Island Reds of the same age on the same place only one had been lost. The symptoms were not particularly characteristic, the birds seeming to lose their appetite, standing around much of the time with their eyes closed and gradually wasting away. After an illness lasting several days, death resulted, apparently from starvation. On inquiry it was found that a similar trouble was being experienced on a farm a mile below this one, where examination showed that eight Plymouth Rock pullets had died. Two more were killed for examination.

The gross examination in these two flocks at this time showed a very noticeable enlargement of the proventriculus. On opening this organ there seemed to be a deep reddening around the orifices of the glands. In the more extreme cases there appeared to be a grayish exudate on the surface, simulating ulceration. The owner of the chickens had previously noticed this excessive size of the proventriculus.

In the light of the later developments it is interesting that the daughter of the lady who owned the chickens on the first place visited and who lived some distance away, but was visiting at the place at that time, made the observation that the snails in the ditch which ran by the house must have something to do with it. When the chicks were first purchased she took half of the whole number to her place and had experienced no trouble. She had noticed that her mother's chickens were feeding on large numbers of snails that were present in the ditch.

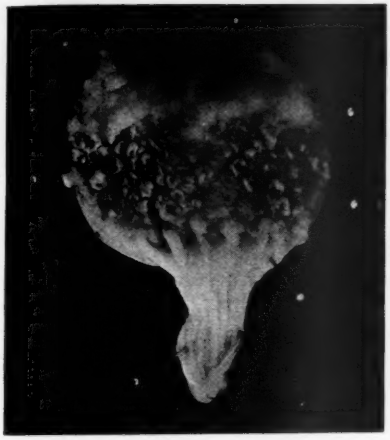
SPECIMENS were sent to the laboratory at Fort Collins for further examination, where it was discovered that a fluke of almost microscopic proportions was present in the proventriculus in large numbers. Once the fluke was discovered it was a comparatively simple matter to pick others out of the contents of the proventriculus after water had been added. The size was approximately three millimeters long by one millimeter wide. The oral sucker was 0.27 mm in diameter and the ventral about 0.33 mm. Specimens sent to Dr. E. W. Price of the Zoological Division of the U. S. Bureau of Animal Industry were identified[1] by him as *Psilostomum ondatrae*. In a personal communication Doctor Price stated that this species had been described by him in 1931 from a muskrat and from a California gull, but that it had not been previously reported in chickens. We find no reference to this parasite nor to a disease of the proventriculus in chickens due to flukes in any of the literature available to us.

Microscopic examination of a number of sections made from the proventriculus showed that the surface of the mucous membrane was covered with a fibrinous exudate, the outer portion of which had become necrotic. Below this necrotic area was a thick zone heavily infiltrated with polymorphonuclear leucocytes. Under this, the mucous layer was quite edematous in which were scattered a few polymorphonuclear leucocytes and a few monocytes. In a few places small abscesses had formed in the lower portion of the mucous membrane. There seemed to be no particular disturbance in the layer of digestive glands. It appeared from the microscopic examination that the flukes had not burrowed into the

[1]Proc. U. S. Nat'l Museum, Vol. 79, Art. 4, p. 1.

glands themselves but had produced the irritation by their presence on the surface of the mucous membrane.

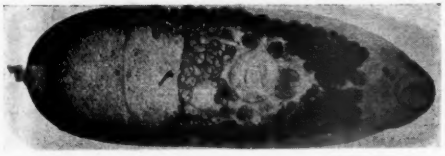
ON SEPTEMBER 2nd three more sick chickens were sent from flock number one, arriving at the laboratory at Fort Collins on Monday the fourth. Two were dead on arrival and the third one died during the



Proventriculus showing ulceration due to flukes.

next 24 hours. All three of these showed the typical lesions in the proventriculus and the presence of numerous flukes.

The two farms were again visited by us on September 7th, at which time no sick chickens could be discovered and no snails were found. Some two weeks previously the water had been turned out of the ditch and the snails had disappeared. It was not possible, therefore, to determine the species



Chicken fluke—Psilostomum ondatrae X 22.

of snail nor the presence of any intermediate stage of the fluke in that animal. The snails, however, were dark in color and approximately one-eighth of an inch long. Whether the chickens got the flukes from eating the snails or from encysted forms in the water or on the grass remains to be determined.

The total losses were given as 32 in the first flock and 10 in the second.

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Experiments with animals have shown that a diet deficient in calcium may cause the optic nerve to degenerate and thus lead to blindness.—*S. N. L.* 24:650.

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The Alkali Disinfectants

Lye (sodium hydroxide) in the form of the high-grade household product, has been found to be one of the most economical disinfectants for use on the farm. When used in a cow barn, one part of lye to 150 parts of water, that is, one can of high-test lye to fifteen gallons of water, destroyed all germs of the colon and abortion groups within a few minutes. Even when cultures of the abortion germs were mixed with 25 per cent egg white to imitate the discharges of infected cows, the lye solution was effective. It was unnecessary to heat the lye solution in order to do a thorough job of disinfection, although a liberal application of the one to 150 solution was found desirable. Accompanied by thorough scrubbing, lye solution removed the caked discharges and manure from the walls and stanchions. The barn was left clean and free from objectionable odors. For use in the milk house nothing is as good as lye. As already stated, when applied daily to the floor in the strength just mentioned, it prevents the disagreeable odor produced by the souring of milk. Lye has the disadvantage, however, of not killing the germs of tuberculosis.

Whitewash, if freshly made from quick lime, is an efficient germicide. Surfaces that are cleaned and then sprayed with whitewash are rendered safe. Carbolic acid and compound cresol solutions are commonly added to whitewash, yet contrary to general opinion do not greatly increase its germ-killing power. If partially slaked lime or limate is used to make whitewash, lye should be added to increase its alkalinity, and make it a dependable germicide.—*F. W. Hadley and E. C. McCulloch in Cir. 126 Wisc. Exp. Sta.*

Poultry Diseases and the Practitioner

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PRIMARILY I think it is admitted on all sides that the problem of poultry diseases has been greatly neglected by the practitioner, in this country.

Looking into the question, it appears to be difficult to understand why this state of affairs should exist. It is obvious, of course, that years ago poultry diseases were not included in the curriculum of our training centers, but in those days poultry keeping on a commercial scale had not yet arrived. Now the training is given at our colleges to help our younger professional brothers to cope with the questions of disease in poultry.

To say that many had no training in this work at college is by no means an excuse, because whilst at college we were taught pathology and bacteriology and the prevention and cure of disease. Once this knowledge has been acquired it matters little whether the patient is a bird or a beast.

I suppose much the same state of affairs must have been present when dogs and cats entered our field to a very much larger extent than heretofore. For a time when these changes occur there appears to be an apathy or possibly a reluctance—not knowing as much about the conditions of the new field as was known of the old. The two changes to new fields cannot be strictly compared, because with dogs and cats there is a marked sentimental value to be taken into consideration and the fact that it is not customary to find these animals in large units.

It is well known to all what vast strides have been made by the poultry industry and how large is the amount of money that is now invested in this branch of agriculture. We have witnessed the passing of the barndoor fowl and the arrival of the mammoth incubators, hovers and brooders. Few persons enter upon a general agricultural career without previous training and experience, but large numbers of our countrymen have taken up poultry keeping, many on a large scale, without any previous knowledge of livestock. Therein lies one of the great problems of the industry; many owners have no knowledge of the requirements of a bird in health and are hopelessly handicapped when disease occurs.

One might with advantage trace the existence of many poultry farms. A person is out of work or requires an open-air life, a small capital is available, and few years ago the prospects appeared to be favorable. A small portion of ground is obtained, with housing accommodation, and a few birds purchased. Probably all this has been done without consulting anyone who may be in a position to give him sound and helpful advice. In the first season chickens are either reared or purchased as "day olds" and probably, when the person has been in business one year, he finds he has been quite successful financially and increased the number of stock three or four times by the aid of his chickens. These chickens have done well and come to the laying season without the necessary increase in acreage or housing accommodation, possibly due to shortage of capital. Such progress may continue, but for a very limited period. The ground which was used by five hundred birds now carries two thousand or more. The land becomes fowl sick, diseases introduced with the first-purchased adult stock become more prevalent and soon an epizootic will devastate the stock. The owner, having little knowledge of livestock, probably sees few of the early symptoms and indications that something is radically wrong. He has probably read much in the popular poultry press and books on poultry keeping

*Presented at the 51st Annual Congress of the National Veterinary Medical Association of Great Britain and Ireland, Llandudno, Sept. 18-23, 1933.

and, finding birds dead, attempts to deal with the problem by means of patent medicines, etc. Such unfortunate owners are usually driven out of the industry by financial losses due to outbreaks of disease. It is well known that it is the disease problems which prevent many owners making a successful career of poultry farming.

Let us examine the fundamental laws that have been broken by these unfortunate beginners.

Before taking a piece of land it is very advisable to have some competent authority to give his opinion regarding the suitability of the site and the land for poultry keeping. The most suitable land must be well drained, level or with a gentle slope to the southeast, a good medium loam, not clay, but not so light that pasture is easily burnt off in summer. The pasture should consist of good permanent fine grasses, and should not have been used during recent years for poultry.

With the purchase of adult stock there is always the danger of introducing diseases, bacterial or parasitic. It is much the wiser plan to purchase eggs or day-old chicks and build up the flock in this manner.

Advice can readily be obtained from competent persons regarding the type of houses most suited to one's needs, the extent of housing required and the breeds which give the best results under the conditions contemplated. Such advice is very valuable and often in the first place prevents excessive capital being expended in housing accommodation.

The arrangement of the ground should be such that a certain area is given over exclusively as a rearing ground and on no account should this be used for adult stock. In this original planning a small area is required for an isolation pen, where adult birds can be quarantined on arrival as newly-purchased stock or when returned from shows and trials.

Finally, the new poultry farmer requires advice regarding the number and breed of birds his ground will safely carry, taking into account the system of housing, etc., to be employed, and a severe warning that overcrowding can end only in disaster.

All this advice should be given by one who knows livestock in health and disease, and understands their requirements in foodstuffs, and hygienic accommodation and surroundings; there is no question that the veterinarian is the only person who is qualified to give this advice.

The average individual fowl is of relatively small value, but when birds are housed in large units, an outbreak of disease can be a ruinously expensive affair. In the diseases of poultry, as with the animals usually found on the farm, it is in prevention that the services of the veterinarian can become so valuable and esteemed.

Notes from the Diary of a Practitioner

LEAVING the surgery in the morning on my round of calls, my first visit was to an old client, to examine a beast. During the conversation with the farmer I was informed he was experiencing a heavy death rate in young chickens. He installed last year a battery brooder in a wooden hut and fitted an anthracite stove as the heating appliance. Walking across the yard, I found a new, well-built wooden house, with plenty of window space. Entering, I at once noted a hot, dry, stuffy vitiated atmosphere, with a thermometer reading over 70° F. instead of 60° to 65° F., and found curtains made of bagging hung over the doorway and many of the windows and all the ventilators closed with bagging. No living creature can be properly reared in such an atmosphere. Further examination showed that the heating apparatus, using coal as fuel, was placed within three feet of the battery brooder, and the flue pipes extending to the ceiling of the hut, with several joints made by metal collars placed around the pipes with no packing material in the joints, permitting the escape of gases into the room. All these points require correction; fresh air is essential by means of adequate non-draughty ventilation, the stove should not be placed in close proximity to the brooder, and the flue pipe should pass out of the hut at a low level and joints packed and made thoroughly gas-proof. On the other hand, the atmosphere may be too cold, and obviously more heat is required, but it is necessary to stress that hot air need

not necessarily be impure air. Feeding stuffs are now often mixed by the poultry food manufacturers and usually they are of good quality and suitable, but they should be examined to ascertain that they are fresh and wholesome. Musty foods must on no account be used.

The owner had not sent away any of the dead chicks for examination. This should be done for bacteriological examination to be carried out. The busy practitioner usually has not the time at his disposal to carry out this examination. If he carries out a post-mortem examination he may find an almost total absence of foodstuffs in the intestinal tract of the chickens. This is frequently seen in young birds that are housed under unsuitable temperature conditions, either too hot or too cold, or a condition of diarrhea may be evident. Fluctuations of temperature quickly disturb the digestive system and cause diarrhea in the young chickens. A negative bacteriological report from the laboratory will usually indicate the absence of any contagious disease. The temperature and ventilation of the hut having been corrected and the necessary attention given to flue pipes, no further losses were experienced.

VISITING my next client, I was informed that the young birds had been out in night arks about five days and now they were noticed to be mopy, standing about, sneezing, and the nostrils were occluded with a gummy substance. The night ark is usually fitted with a slatted floor, and in this instance it had been placed on badly drained ground; pools of water were about, and a large number of young stock huddled together around the house. Examining the affected birds, one found the gummy material over the nostrils was easily removed, and when pressure was applied to the upper portion of the nostril a clear to pale-yellow, thin fluid exuded. Careful examination of the mouth parts, comb and body of the birds established the absence of any sign of pox lesions. With the history of the case, absence of fowl pox in other groups of birds on the farm, it was fairly safe to diagnose roup as the condition found in these sick birds. The birds had been brought from dry, warm quarters and too suddenly placed in a possibly draughty night ark situated on damp ground, and this outbreak was the result. The severely affected birds should be killed and the remainder kept in strict isolation. Slightly affected birds may have the gummy material removed from the nostrils and antiseptic treatment applied locally. The birds should be accommodated in non-draughty houses on well drained land. These measures should have the effect of bringing the stock back to a healthy condition.

AFTER examining a horse at another farm I was told by the farmer that he had had very bad luck with his young turkeys this season. Towards the end of the hatching season for chickens there was a fairly heavy death rate, but the earlier hatches were excellent. Probably the weather was incriminated as the cause of this loss, but the loss of the poults was really serious as the profit from these birds is distinctly good. He had used an incubator for hatching the hen eggs and at the time the losses in the chickens occurred he had a large number of turkey eggs in one tray of the incubator along with some hen eggs. These were all due to hatch out about the same time. There was not a large death rate in the chickens, but quite serious losses were sustained in the poults, and these represent much more money than the chickens.

The bacteriological examination of some of the dead chickens would have revealed *B. pullorum* as the cause of death. Knowing that turkeys are susceptible to this organism, it is not surprising, when one reads the report of the bacteriologist, to find that this organism was also the cause of death of the young poults. Turkey eggs should not be placed in incubators containing hen eggs, owing to the susceptibility of both to infection with *B. pullorum*. Contact between chicks in the incubator for a very short period is sufficient to infect many from an original focus. Blood testing all stock is the best method of creating a bacillary white diarrhea-free flock from which health stock can be reared.

THE next visit was to a poultry farm, the owner of which has been a client of mine for a few years. Besides 5,000 to 6,000 head of poultry he keeps a few cows and two or three good hunters. He had had trouble with one of his mounts, which had been out at grass a considerable time. After walking with the owner to see the mare, and finding she was making good progress, conversation turned to the poultry side of the farm. The owner was much worried about a steadily increasing death rate in his older birds.

About two years ago we had had a chat about poultry, which mostly concerned the large increase in the number of poultry farms in the district and what the financial prospects were likely to be. Disease questions were mentioned, but I said I had not studied poultry diseases seriously and therefore did not consider I could be of great help to him.

That sentence prevented the farmer bringing his poultry problems to me for a period of two years. The trouble now was an unexplainedly high death rate and loss in condition of the older birds. Walking over to the poultry farm, the young stock all appeared to be in excellent condition, the ground rather bare, but the farm generally well managed, with one vital exception—everywhere the houses were accommodating too large a quantity of stock. Overcrowding is one of the most deadly sins of the poultry industry and found in all parts of the country.

Arriving at the pens housing the two- and three-year-old stock, one noticed some were crowded in groups inside the house and many outside sheltering near the building. Some were standing on one leg, the feathers dull and unkempt, the comb and wattles small and white to gray in color. A number of the birds were rounded up and, on handling, found to be in varying stages of thinness. Three of the thinnest birds were killed and a post-mortem examination made.

An identical condition was revealed in each bird: liver enlarged and studded throughout the surface and substance with small white nodules, varying in size from a mere speck to nearly one-quarter of an inch in diameter. The spleen was enlarged and showed many large lesions, changing the contour from one smoothly rounded to one with irregular protuberances. In two birds nodules were found on the serous surface of the intestines which, when incised, showed a whitish-yellow caseous content. I explained to the owner my suspicion, but that I would require to make a bacteriological examination from the lesions on my return to the surgery.

On the 'phone in the evening the owner was informed that the problem he was up against was that of tuberculosis. It was, therefore, decided that all the stock on the premises should be tuberculin tested. Rings were to be fitted to the birds and the test to be carried out next week. With a small spirit lamp sterilizer, hypodermic syringes, needles and tuberculin packed in the car, I set out for the farm. About 150 birds per hour were tested with tuberculin, and any emaciated birds passed up for testing were culled. These were killed and post-mortem examination revealed gross lesions of tuberculosis. All these birds were sent to the incinerator, the best method of dealing with this gross infection. Forty-eight hours after the tuberculin test was made, the reactions were recorded.

The final results clearly showed the slow insidious type of the disease. In the pullets, less than 1% gave a positive reaction, whereas in the eighteen-months to two-year-old birds 15% reacted, and in the two-and-a-half to three-year-old birds 22% gave a positive reaction. All reactors were removed immediately from the flock.

This removal of infected stock helped considerably in reducing the former overcrowded condition. Some new houses were placed on land which had not been used previously for poultry, and to these the young birds were transferred. The vacated houses were thoroughly disinfected, scraped and cleansed and left exposed to the action of the sun and atmosphere. The soil adjoining the houses was dug up and removed away from any possible access by poultry or other animals and the remainder of the runs treated with two tons of fresh-ground

quicklime and ploughed in. The runs should be given, where possible, a rest for twelve months. The houses and runs used for the older birds were vacated for a time and subjected to a thorough disinfection and cleansing, the soil around the huts being removed as from the other runs, and replaced by cinders to the depth of about nine inches. It is obvious that the gross contamination of the runs is around the houses, because it is here the birds stand about, and the organisms passed in the droppings contaminate the land. The remainder of the run was limed, ploughed, and to remain unoccupied for twelve months. The poultry farmer annually purchases a large number of high-priced stock birds; these are now to be bought subject to passing the tuberculin test, to prevent the introduction of more infection by this route.

It is arranged that all birds that die shall be sent to me for post-mortem examination in order that a record of the cause of death may be kept. Also all the stock will be tuberculin tested again in six months' time and subsequently once per annum. By means of these methods it is hoped to clear this heavily infected flock of this insidious and dangerous disease.

RETURNING for lunch, I found a telephone message, stating that a poultry farmer would call at 2 o'clock with some chickens for examination. The farmer has had quite good hatches and the chickens doing well until about three days ago, when they were a month old. Each morning for the last three days there have been many deaths, and the majority of the chickens look unwell, huddle together, their feathers ruffled, wings drooping, droppings thin and blood-tinged. The six chickens for examition are representative of the sick birds. The history of the trouble is well illustrated in their appearance. A post-mortem examination was carried out, and in each case with identical findings. The ceca were enlarged, full, tense and dark-colored. When the ceca were opened the contents appeared as a clot of blood, with much damage to the mucous membrane. A smear prepared from the blood clot and examined under the microscope disclosed large numbers of öocysts, which permitted the diagnosis of coccidiosis to be made.

There is no substance known that will prevent or cure coccidiosis. Whilst this is unfortunately the case, there is much one can do for some poultry farmers, and it is most desirable to see their birds and the premises. It was therefore arranged that a visit should be paid to the poultry farm.

The farm was found to be situated on low-lying ground, heavy clay land, with much water standing about, and long coarse grass. The houses were mostly of the type permanently fixed in one position; the ground around them was quite bare, large dust-bath holes filled with water, in all directions. Inside the houses there was much evidence of similar neglect: dropping boards covered thickly with feces and the litter on the floor very old, dusty and dirty. The young birds were not ranged separately but could pass freely through several runs used by the adult stock.

I explained that a separate piece of ground should be devoted exclusively to the young stock as a rearing ground, and any stock escaping from this area should not be allowed to return. When the birds are three months old they should be moved to other ground, and at the end of the season the rearing ground should be cleaned, well limed and kept free from birds until next year. The houses must be kept thoroughly clean, droppings removed from the boards daily, without exception, and litter changed when it becomes dirty. Around the houses the bare ground should be dug up to a depth of six to nine inches and the soil removed, away from contact with birds, and cinders laid down around the hut. Dust-bath holes are to be filled, the land drained and the grass cut or cropped with sheep, and all rank weeds removed.

Obviously all the young birds which show symptoms of coccidiosis should be removed from the flock and destroyed. The culling of these birds should be carried out in a vigorous manner, because few birds that have been affected with coccidiosis make up

into good, healthy, normal stock. The houses occupied by the young stock require disinfecting, scraping, and all litter and refuse to be burnt. It is essential when dealing with these disease problems to ensure that infection is not carried from one pen to another by means of the attendant, his boots and clothes, or by implements and utensils.

DURING my round when coming through a village, I was handed a message from a client at the Manor Farm. Turning along to the old place I found the farmer was wanting help with regard to his turkeys. He told me it was noticed a few days ago that the turkey stock were standing about a great deal and apparently not very keen for food. This morning, when giving them their feed, he noticed three could not completely close their mouths, and closer examination revealed cheesy material on the tongue and in the mouth generally.

On examination I found all the birds had lesions on the less feathered parts of the head. These lesions showed as firm, rough, wart-like growths, varying in color from yellow to brown. The lesions in the mouth, on the mucous membrane of the tongue and mouth parts generally, showed as masses of tough cheesy material. With a scalpel, this deposit could be removed from the mucous membrane, revealing a red, raw surface. I was informed that the turkeys for two months had not been allowed range with the poultry and that the latter all appeared to be healthy. Three weeks ago five young turkeys had been bought in the local market and brought home and placed with the home-reared birds. Today these five birds were all found to have lesions on the head, and during the first few days after their arrival on the farm it had been remarked that very frequent fights had taken place.

The treatment of fowl pox is not found to be economically or scientifically sound; a large amount of attention requires to be given to the affected birds, dressing the lesions and strict isolation enforced, otherwise the disease will spread to the remaining susceptible birds. Twenty-two birds were found to have lesions on the head or in the mouth, and as these well-grown birds represented a large amount of money to the farmer he wished to try treatment and was willing to ensure the isolation of the affected birds and the removal of the healthy stock to clean ground.

Six of the most severely affected were killed; it was decided to dress the affected parts of the remainder, removing the deposit on the mucous membrane of the tongue and mouth parts and the warty growths on the head, burning all this removed material. Repeated cleansing of the parts and dressings are essential. The healthy turkeys were vaccinated with fowl pox vaccine and kept in isolation for three weeks and then moved on to clean ground. All the poultry stock on the farm were also vaccinated. Some weeks later I was informed that there had been no extension of the disease and now all the stock were healthy and doing well.

A MESSAGE was received that one of my clients was having serious losses amongst geese, and could a visit be arranged at the earliest? Arriving at his farm, I found that he had received delivery of 400 geese from the Continent. When delivered by the railway company, twenty-five were found dead in the crates and many obviously sick. The farmer in previous years had purchased geese from the same source in September or October to prepare for the Christmas trade. These geese had been housed in a covered yard, and on my arrival the total dead numbered forty-two. Many sick birds were found in the flock, showing a yellow discharge on the feathers around the vent, and a greenish, brown or red diarrhea. Two hundred and twenty birds which appeared to be normal were removed to another shed and all the sick birds were killed.

Post-mortem examination revealed very constant findings. A reddening of the skin of the abdomen and breast was conspicuous and a general congestion of the blood vessels of the visceral organs. In many the heart showed punctiform hemorrhages and deep-seated hemorrhages of the intestine, particularly in the duodenal areas, many of these being evident from the peritoneal surface.

The microscopic examination of stained blood smears from the heart and elsewhere revealed large numbers of bipolar organisms. With these findings the diagnosis of fowl cholera was made, to be subsequently confirmed at the laboratory by animal inoculation.

The introduction of adult birds is always attended by the risk of bringing disease on to the premises, and particularly so when the birds are imported from abroad. Isolation of such birds is essential, and the only reliable method of preventing disease occurring in the home stock. Fortunately my client had carried out this measure, and thus prevented the disease passing to his own flock of 600 geese.

All the carcasses were destroyed by fire and a close watch kept for any symptoms of disease in the remaining imported stock, the farmer himself tending these birds, ensuring cleanliness and disinfection of the shed, drinking vessels, etc. Only five birds later showed any symptoms of cholera and these were promptly killed, the remainder making up into fine birds.

ABOUT three weeks later I met the same farmer in the market and we were talking over his trouble with the imported geese. He said he would like me to call to see twenty geese he had at another small farm. These were not home-hatched, but had been purchased from a small holder near by, and he considered they had never really done well, and when seeing them the previous day (the first time for about a month) he noticed how weak they appeared. He found from his man that they had been losing condition during the past week or so. I was near the farm during the following day and called and examined the birds. They were very debilitated and in poor condition. The smallest bird was very poor, and I decided that this bird should be killed and post-mortem examination made.

The heart, lungs, liver and kidneys appeared to be quite normal to naked-eye appearance, but the intestine was very thin, the contents being of a slimy mucous type. Examining the lining membrane of the gizzard after removal of the grit and other contents, I noticed brown crusty patches and amid these lesions fine white threads could be seen. Plunging the organ into a bowl of clean water I could see a mass of hundreds of waving threads, resembling fine white cotton thread, floating in the water. Removing the gizzard from the water and teasing the crusty patches, the thread-like pieces came away. Examination showed them to be *Amidostomum anserus*, the gizzard worm of geese, about half-an-inch long, their heads buried in the wall of the gizzard and the tail protruding into the lumen of the organ. The life history of this parasite is not completely known, but is considered to be similar to that of the large round worm and the cecum worm, except that the eggs hatch on the ground and the minute young worms are taken up with the food and bring about infection.

It was decided to treat the remaining birds of the group with carbon tetrachloride, one 3cc capsule being given to each bird. This dose proved to be very suitable for the birds in question, though when birds are to be treated it is often wise to try a dose varying from 2, 3 or 4cc, depending upon the weight of the bird. Wet land should be avoided, as it is under such conditions that the worst outbreaks occur. Goslings should be kept completely apart from old birds, which may be infested with the parasite.

I AM frequently consulted regarding the condition in poultry known as gapes, the tracheal infestation with *Syngamus trachea*.

The symptoms occur when the birds are about fourteen days old, and are rarely seen in birds over four weeks of age. A curious cough or sneeze with a shaking of the head is noticed; later the birds stretch the neck forward with the beak open, trying to take in more air. In the advanced condition the feathers become ruffled, the wings droop, the eyes are often half closed and give a general appearance of dejection. Death usually follows, due to suffocation. Many of the eggs passed by the worms are coughed up into the mouth of the birds, swallowed, and reach the ground with the droppings. After a period on the ground a minute em-

bryo develops within the egg, but a minimum period of nine days is necessary before it can infect another chicken. While lying on the ground the eggs may be swallowed by earthworms without suffering loss of vitality, and thus chickens may be infected by eating earthworms containing ripe eggs. The young parasites eaten by chickens pass through the bowel wall and are carried into the blood stream to the lungs. Nine days from the ripe eggs being swallowed the young worms reach the trachea and in eight to eleven days the females begin to lay eggs. The life cycle can be completed in twenty-six days.

Adult fowls rarely harbor the parasites and are difficult to infect artificially, whereas adult turkeys under natural conditions frequently harbor the parasites and show no symptoms. These birds may therefore carry the disease from one breeding season to the next.

To control this infestation one recommends that turkeys and chickens must not be kept together and that chickens should not be reared on ground where an outbreak has occurred the previous season, as the gapeworm eggs can survive through the winter. Finally, the intensive rearing of chickens up to six or seven weeks old in houses where droppings are removed frequently and regularly, completely controls the parasite.

The Source of Rabbit Disease

A search will be conducted in northern Canada for the source of the rabbit disease, tularemia, this winter, by Dr. Robert G. Green, bacteriologist of the University of Minnesota, and a party including Dr. J. A. Allen, pathologist for the Province of Manitoba.

Dr. Green believes that tularemia and other diseases of small animals may have a northern center of origin. He seeks to find out what causes "die-offs" of such animals on a continental scale about once every ten years. The next die-off is due next year.—*Literary Digest.*

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Government food and drug officials find that a good many caustic poisons now on the market are not properly labeled so as to show their dangerous character.—*S. N. L.* 24:650.

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Anemia of Suckling Pigs

Kernkamp* made more than 1,100 examinations of the blood of pigs under conditions favorable to the production and to the prevention of anemia in suckling pigs. The examinations were made at approximately seven-day intervals and revealed the averages shown in the accompanying table.

"Blood Pictures" in Suckling Pigs

Age	Erythocytes Figures in Millions		Leucocytes Figures in Thousands		Hemoglobin Grams per 100cc	
	Access to Soil	No Access to Soil	Access to Soil	No Access to Soil	Access to Soil	No Access to Soil
At birth	5.5 to 7	5.5 to 7	9 to 16	9 to 16	9 to 13	9 to 13
One week	3 to 4.5	3 to 4.5	9 to 16	9 to 16	6 to 9	6 to 9
Two weeks	5 to 6.5	2.5 to 4	9 to 16	9 to 12	7 to 10	3.5 to 6
Three to Six weeks	5.5 to 7	2.5 to 4	9 to 16	8.5 to 11	9 to 12	3.5 to 6
Seven weeks	6 to 7	5 to 6	14 to 20	11 to 18	9 to 12	5.5 to 8
Nine weeks	6 to 7	5 to 6	14 to 20	11 to 18	9 to 12	5.5 to 8
Twelve weeks	6 to 7	6 to 7	14 to 20	12 to 20	9 to 12	7 to 10.5

*Kernkamp, H. C. H.; The Blood Picture of Pigs Kept Under Conditions Favorable to the Production and to the Prevention of So-Called "Anemia of Suckling Pigs"; University of Minnesota Agricultural Experiment Station, Technical Bulletin 86, December 1932.

Abstracts

Treatment of Fractures in Dogs by the Aid of Rigid Bandages

Folmer[1] states that the motorization of vehicles especially in the larger cities has multiplied accidents and especially so canine fracture cases. In the majority of cases the immobilization of the fractured parts cannot be accomplished by a simple bandage with splints; the lack of control over dogs demanding employment of more appropriate bandages.

He had used plaster of Paris, paste and tar, but found that their weight made them a decided inconvenience, especially with small dogs.

Finally after much experimenting he settled on the use of sodium silicate (soluble glass) on account of the following advantages:

1. It is inexpensive.
2. It is easily obtainable.
3. It may be used directly without warming or diluting.
4. The weight of the bandage is increased hardly at all by the absorption of the silicate.
5. The bandage is impermeable and very hard.
6. It possesses adhesiveness sufficient to become fixed to the subjacent tissues.
7. Although having a disagreeable taste and smell it is not toxic.

Folmer uses absorbent gauze bandages, wrapping directly over the fractured area to be immobilized, without the use of padding. He takes the precaution of making a few turns about the limb first without wetting and then he soaks the bandage with silicate, in this manner the adherence with the hair is not strong; this facilitates easy removal. As the bandage dries it contracts somewhat and it is important to take this into consideration. Also to examine the bandage when dry and if the degree of constriction is too great it may be relieved by incisions into the bandage. In cases where he wants great rigidity, Folmer interposes bamboo splints.

[1] FOLMER.—Traitement des fractures à l'aide de bandages rigides. (*Tijdschrift voor Diergeneeskunde*, Aug. 15, 1932). Revue des publications, Pathologie Chirurgicale, *Annales de Médecine Vétérinaire*, April, 1933. Abstracted by J. G. Horning.

Adrenalin in the Treatment of Cronic Bronchitis of Dogs

PATOUT[2] of Toulouse states that in the course of chronic bronchitis, a frequent disorder with dogs, various complications take place which aggravate the condition, weakening the subject or killing it. The principal complications are edema of the lungs, straining for removal of the bronchial exudation and above all the dyspnea fits produced by a vago-sympathetic unbalance. For these conditions Patout recommends the sub-cutaneous injection of adrenalin chloride solution, 1:1000 giving 1 cc. each day. Injected in this way, the adrenalin does not produce vascular changes or a deficiency of blood in the liver or brain, even though used over a long period.

Gastro-Intestinal Syndrome in Rabies

ANANIADES and Antoniades[3] relate the case of a dog under their treatment and call attention to the fact that very grave gastro-intestinal troubles can hide almost completely the other symptoms of rabies and render mistaken diagnoses relatively frequent. This case was a setter dog that became ill suddenly, shortly after returning from a hunt. The symptoms were those of gastro-intestinal hemorrhage and treatment for that condition was instituted.

No aggressiveness was displayed by this dog towards other dogs nor people; there were no modifications in his character, no signs of a paralysis, nor paresis; not even constraint of movements in any region of

[2] PATOUT.—L'adrénaline. Essai d'emploi dans le traitement de la bronchite chronique du chien. (Thèse, Toulouse, 1931.) Revue des Publications, *Revue Vétérinaire et Journal de Médecine Vétérinaire et de Zootechnie*, February, 1933. p. 91.—Abstracted by J. G. Horning.

[3] Syndrome gastro-intestinal de la rage chez un chien, par Ananiadès et Antoniadès. (*Rev. gén. de méd. vét.*, 15 Juin 1932).—Revue Des Publications, *Annales de Médecine Vétérinaire*, February, 1933.—Abstracted by J. G. Horning.

the body. The dog's condition became gradually worse from this evident trouble and death occurred in three days.

An autopsy showed a congestion of the whole gastro-intestinal tract, with heavy hemorrhages in the stomach and intestinal mucosa; no foreign bodies were found in the stomach.

During the forced administration of medicine, the dog defended itself strenuously, which was assumed to be natural, and the owner was wounded. On account of the frequency of rabies in Greece, the bitten owner decided to take the anti-rabies treatment.

Laboratory examination of the brain revealed negri bodies, and this was further confirmed by rabbit inoculation.

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Methods of Producing Milk With High Vitamin D Content

There are three methods of producing vitamin D milk: (1) By feeding irradiated yeast to cows; (2) by adding cod liver oil concentrate to the milk; (3) by irradiating the milk.

Milk from cows fed the proper amount of irradiated yeast will contain about 160 Steenbock rat units of vitamin D per quart. Such milk is effective in preventing or curing rickets in children. The method is successful but inefficient in that but only a small percentage of the total number of rat units of vitamin D fed to the cow is recovered in the milk. The cost is about one-half cent per quart.

In the second method, sufficient vitamin D cod liver oil concentrate (vitex) is added to give the milk 150 Steenbock rat units of vitamin D per quart. The cost is about one-half cent per quart.

In the third method, by exposing the milk in a thin film to the rays of flaming carbon arc lamps, the milk may be given a vitamin D content sufficient to prevent and cure rickets. The cost of adding vitamin D to milk by this process is very low, but the equipment required is expensive and the method is suitable for use only on a large scale.

Swine Eyrsipelas Organism Causes Arthritis in Lambs

Sporadic cases of bovine infection with the bacillus of swine erysipelas are probably widespread in France, but there also exist localized areas in which a high morbidity of from 10 to 23% is encountered. The disease usually assumes the form of a chronic and persistent arthritis. A post-mortem examination may show a definite pitting of the articular surfaces especially in those of the femur, tibia and radius.

In this article, Carré[18] shows that the intravenous inoculation of a lamb with a porcine culture induced a transient lameness followed by an apparent recovery but a postmortem examination seven months later revealed a slight infection of the tibiotarsal articulations which yielded a pure culture of the organism.

It is suggested that, under natural conditions, the umbilicus is the probable portal of entry.—Abst. in *The Veterinary Bulletin.*

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The Importance of Veterinarians in Mexico's Economic Welfare[4]

THE propaganda and teachings imparted by the small number of veterinarians employed by the Secretary of Agriculture and Fuel of the Republic of Mexico to watch over and promote the live stock industry has produced such flattering results that plans are now in process of being carried out for the furtherance of this splendid work.

Their promotion and safeguarding the live stock wealth of the country, the inspection of food products of animal origin and their teachings in the sanitary precautions necessary for the transportation, handling

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[18]Carré. (1932). Sur le rouget articulaire et osseux du mouton. (Polyarthritis in Sheep caused by *Erysipelothrix rhusiopathiae.*)—*Bull. Acad. vet. France,* 5. 301-307. 2 text figs.

[4]Importancia de la Carcera de Medicina Veterinaria, pp. 8, 13. *El Noroeste de Mexico,* Periodico de Agricultura y Ganaderia Medicina Veterinaria, Jan.-Feb., 1933.
Abstracted by J. G. Horning.

and care of these products has been an invaluable help to the society in general, as well as benefiting the producers, lessening the imports of these products and increasing the exports, while at the same time increasing home consumption. The exports in hides alone for one year were seven million lamb and goat hides, several hundred thousand hides of cattle. In 1925 Mexico imported 145,541 cases of eggs; this was gradually reduced until in 1932 only 900 cases were imported. The population of Mexico City consumes 150,000 liters of milk daily.

In meat and sanitary inspection with their relations to Public Health this is carried out mostly in the Federal District and one of two capitals of other provinces and still has considerable plans to be worked out for the rest of the counrty.

The concordat made with other countries, especially the United States, for mutual cooperation regulating the shipment of live stock and food products for the prevention of disease creates further work for the veterinarian along the frontiers. The general direction of animal breeding in view of its importance has strict regulations which comes under the Sanitary Police of Animals for enforcement.

To realize this program of action the Rector of the National University arranged for numerous conferences to be held and the necessary publicity given to reach prospective students and the people so that they could appreciate the benefits to be derived from following this splendid profession. It is due to his clear vision of the problem in hand that so much has been done about the matter.

He has arranged for radical changes in the pedagogic organization of the school, also allowing preparation for the degree of Bachelor of Biological Science to be studied at the same time with the Veterinary course. Instigated the giving of fellowships and through his kind office he has also granted twenty-five pensions of $30.00 monthly for students that distinguish themselves in their studies. This was done to stimulate interest among the youths towards taking up this wonderful profession.

The Rector of the University deserves much credit for his kind services in this work. Already a large number of students have presented themselves for enrollment. Material changes have been made at the Veterinary Institution, located in the Plaza of Santa Catarina, to take care of the larger enrollment.

With only 160 veterinarians, half of whom work exclusively in the Mexico City area, there is naturally a shortage necessary to guarantee an effective social service.

J. F. Rulfo, Member of the National Academy of Medicine and a distinguished member of the profession, has recently been appointed Director of the Faculty of Veterinary Medicine of the National University.

Doctor Rulfo is a well known scientific investigator and for some time has held important posts with the Faculty of Veterinary Medicine, the Institute of Hygiene and the Department of Public Health.

His election to this responsible post, with his splendid knowledge of the conditions that confront him, will without doubt result in great benefit to the profession.

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Acidosis in Chronic Nephritis of the Dog

Lacroux[5] in his researches confirms the existence of a non-gaseous acidosis in the course of chronic nephritis of the dog. He observed that:

1. The alkaline reserve is always lower than normal and that on the contrary there is a hyperchloride present.
2. The hyperchloride condition and the insufficiency of the alkaline reserve do not always correspond.
3. The alkaline reserve can reach very low figures (16.8 in place of 51).
4. Acidosis should be given a grave prognosis.
5. The most rational therapeutics after discovery of acidosis should be renal medication in connection with a dechloridation and an alkaline diet.

[5] LACROUX.—L'acidose dans les néphrites chroniques du chien, (*Revue Vétérinaire*, août 1932). Revue des publications, *Annales de Médecine Vétérinaire*, March, 1933. Abstracted by J. G. Horning.